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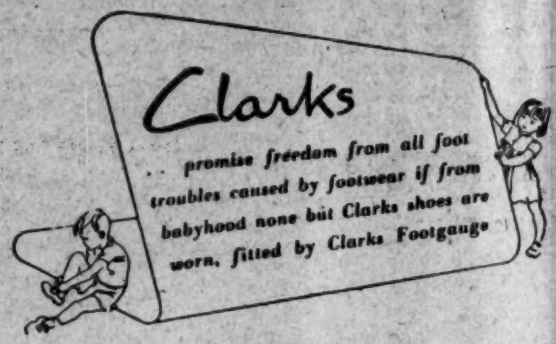
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 30 1947

THE EARLY TREATMENT OF POLIOMYELITIS

BY

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The present and quite exceptional prevalence of acute poliomyelitis has stimulated interest in two questions that concern medical administrators and clinicians alike: At what stage should the orthopaedic treatment of the disease begin, and what are the essential features of that treatment? In this short paper an attempt is made to answer these questions in the light of our present limited knowledge of the disease. Difficulties in diagnosis will not be considered, nor the treatment of what might be called the visceral manifestations of poliomyelitis, such as pharyngeal and respiratory paralysis and disorders of micturition, the treatment of which is a matter of urgency and is, or should be, reasonably well understood. The problem is what should be done for paralysed skeletal muscles.

The Period of Isolation

The choice of three weeks as the period of isolation is arbitrary. It cannot be otherwise, since the duration of infectivity is very variable; it may last only a few days after the onset of paralysis so far as the oropharynx is concerned, whereas the patient may continue to excrete virus in the faeces for as long as ten weeks after the disease has declared itself. However, the choice of three weeks as the isolation period seems to be justified by experience, though it may be rather too long. The ideal arrangement would, no doubt, be to admit the patient immediately to a hospital, generally an orthopaedic or children's hospital, in which he could remain for the duration of his treatment; complete continuity of management would then be possible. But there are certain practical objections. Many orthopaedic and children's hospitals have long waiting-lists, and in some places their difficulties are now aggravated by a shortage of nurses. Conditions, particularly in orthopaedic hospitals, are often unfavourable for nursing infectious cases, and in some hospitals young probationer nurses are employed on the understanding that they will not come into contact with cases of infectious disease. At least one-third of all cases of poliomyelitis either fail to develop significant paralysis, or such paralysis as appears is transient and clears up within a week or two; these fortunate patients require no special treatment, and to that extent the beds they occupy in a special hospital would be beds wasted. On the whole, therefore, it seems best to admit cases of poliomyelitis to a fever hospital in the first place, on the clear understanding that someone skilled in the treatment of the disease—which generally means an orthopaedic surgeon—is asked to see the patient within twenty-four hours of admission and is given a free hand to order such treatment as he deems necessary.

The Clinician's Duty

There is still no proven specific treatment for poliomyelitis. Recovery depends on the spontaneous return of function in such of the anterior horn cells of the spinal cord and brain stem as have not been completely destroyed by the virus. The clinician has a twofold duty. First, he must maintain the peripheral parts in the best possible condition, so that when voluntary control is returning recovery will not be vitiated by contractures and other harmful changes that have taken place in muscles, tendons, and joints during the period of paralysis. Secondly, if recovery is not early and complete the patient must be taught to make the best possible use of such return of power as is vouchsafed to him. All the arts of physiotherapy and, at a later stage, brace-making and reconstructive surgery may be required to assist the patient in his return to something like useful activity. But it cannot be too strongly emphasized that no one has ever cured a case of poliomyelitis. All that we can do is to help or hinder a process of recovery that is quite outside our control.

There has been and still is an idea abroad that paralysed muscles, especially those whose nerve supply has undergone Wallerian degeneration, are in a peculiarly delicate state. No less an authority than Sir Arthur Keith (1919) has written:

> "What are the best means of maintaining in health a muscle which has just become paralysed . . . ? Let us look at the condition of such a muscle: . . . the vital contents of every cylinder begin to break up, degenerate, and be absorbed. . . . We wish, as far as possible, to prevent the breaking-up of the muscle cylinders and to maintain intact their original condition so far as we may. Massage applied to the delicate and broken organization of a crippled muscle seems to me calculated to help in the work of destruction. If in any crisis of surgical treatment rest is necessary, it is in the early stages of degeneration of a paralysed muscle."

Splints are applied with almost religious fervour; the limb is handled with great tenderness, stretching of the paralysed muscles being avoided at all costs. The fact is that even a denervated muscle does not degenerate; the changes so graphically described by Keith do not occur. A paralysed muscle retains its essential structure and some electrical

excitability for a number of years after all voluntary power has been lost. There is a progressive loss of bulk, which is very rapid at first, but this is due to a true atrophy; even this shrinkage can be partially prevented by appropriate electrical stimulation, provided that one uses strong enough stimuli of long duration and treats the muscle at least daily (Jackson, 1945). What is needed to keep a paralysed muscle in good condition is not rest but controlled activity. Immobilization is harmful; activity is beneficial. The revolt against rigid splinting has been such that a number of authorities, of whom Miss Kenny is the chief, have condemned splinting outright. This seems to be going a little too far, for there is a place for splinting; it may be needed to prevent persistent stretching of a muscle beyond its normal resting length. Even normal muscle becomes seriously weakened if it is maintained in an overstretched position; how much more, then, is it necessary to protect a muscle which has lost its power of voluntary contraction?

On What Does Recovery Depend?

In poliomyelitis the situation is more complex than after injury of a peripheral nerve. Where there has been extensive destruction of anterior horn cells the muscles supplied by the affected segments of the cord are completely and permanently denervated; there is no hope of recovery, and no treatment is of any avail. But when we consider the state of muscles in which partial or complete recovery subsequently occurs it must at once be confessed that we are not fully seized of the exact nature of the changes that take place. There is, however, no doubt that recovery does not depend to any great extent on axonal regeneration such as occurs after repair of a divided nerve. In the first place, the really worth-while recovery takes place within six months of the onset of the disease, though some further and perhaps useful return of power may be observed between the sixth and eighteenth months. From what is known of the rate of axonal regeneration (1 to 2 mm. a day) it is obvious that at any rate the more distal muscles could not possibly be re-innervated in so short a time—if regeneration had to take place from the cord all the way out to the periphery. Furthermore, most of the muscles that recover well retain throughout the electrical excitability characteristic of innervated muscle. We may, therefore, conclude that those anterior horn cells that are capable of recovery are not usually damaged to such an extent as to cause axonal degeneration. Thus there is no basis for using electrotherapy.

At present our only course is to follow a procedure that long experience has shown to be sound. When the patient is first seen a chart should be made indicating the power of all affected muscles. The paralysis will be maximal within a week of the onset of the disease, and a chart made at this time will give a reliable picture of the extent of the damage. Most orthopaedic hospitals are now supplied with muscle charts, and there is general acceptance of the system of recording recommended by the Peripheral Nerve Injuries Committee of the Medical Research Council:

5 = Contraction against powerful resistance
4 = Contraction against gravity and some resistance
3 = Contraction against gravity only
2 = Movement only with gravity eliminated
1 = Flicker of contraction
0 = Complete paralysis

It has been suggested that the disturbance of the patient involved in making a complete muscle examination is harmful, but unless the paralysis is accompanied by severe pain (see below) so that the actual handling of the patient causes him distress there is no valid reason why the examination should not be made. It is, indeed, a necessary diagnostic procedure.

Splinting

The clinician is now in a position to determine what splinting, if any, is required. The aim is not immobilization but simply the avoidance of vicious postures and the overstretching of paralysed muscles. Let us consider the various parts of the body in turn.

(*a*) *Spinal and Abdominal Muscles.*—Unless the patient is an unruly little child a firm mattress is all that is necessary. A lively infant will need a plaster bed or a gas-pipe frame covered with canvas, and some sort of retentive harness may also be required.

(*b*) *Shoulder.*—The shoulder is largely dependent on muscles for its stability, and there is therefore much to be said for maintaining it in abduction if the abductors are paralysed, either with a pillow or, in the case of an unruly child, with a plaster or metal abduction splint. Contracture of the adductor muscles can develop very rapidly, which is another reason for maintaining the limb in abduction; 60° is sufficient, and neutral as to rotation.

(*c*) *Elbow.*—There are those who regard relaxation of a paralysed biceps as unnecessary, the patient being nursed with the affected arm lying alongside the body. Yet in this position the biceps is maintained at what is very nearly its greatest length, and it is therefore preferable to keep the joint in a position of 60° to 90° flexion when paralysis of the flexors is present.

(*d*) *Wrist.*—The long extensors of the wrist and digits are the only muscles that run any risk of being overstretched by improper posture, and a simple cock-up splint, which must not extend beyond the transverse palmar crease, will give all the support that is required.

(*e*) *Thumb.*—The metacarpo-phalangeal joint of the thumb, like the shoulder, is largely dependent for its stability on the short muscles that control it. A small plaster-of-Paris splint, like a shoe-horn, with its broad end lying over the lateral surface of the lower end of the radius and its narrow end curved round into the web between the thumb and index finger, will prevent overstretching of the paralysed thenar muscles.

(*f*) *Intrinsic Muscles of the Hand.*—From experience in the treatment of ulnar-nerve injuries I am convinced of the need for preventing overstretching of the intrinsic muscles, and there is no very obvious reason why they should not also be protected in cases of poliomyelitis where the long flexors are strong and therefore capable of producting a *main-en-griffe* contracture. All splints for the intrinsic muscles of the fingers are based on the "lumbricales cuff" first described by Kendall and Kendall (1939). A bar of plaster-of-Paris or metal crosses the palm at the level of the transverse crease and is joined to two transverse dorsal bars which lie parallel across the metacarpals and the proximal phalanges, the knuckles being exposed between them; the metacarpo-phalangeal joints are held in a position of about 45° flexion.

(*g*) *Hip.*—The hip should be maintained in the neutral position as in standing, though in small children it may be found more convenient to abduct both joints about 15°, in order to simplify nursing.

(*h*) *Knee.*—The chief danger here is stretching of the posterior capsule of the joint, and the knee should therefore be maintained in a few degrees of flexion.

(*i*) *Foot.*—The neutral position is correct.

In adults and older children the lower limbs are easily maintained in a proper position by small pads under the knees and a board to support the feet at right-angles, provided that the patient is not allowed to slip up the bed. The limbs should be protected from the weight of the bedclothes by means of a cradle. Infants must be splinted; it may even be necessary to splint both lower limbs, when

only one is abnormal, in order to prevent the child from assuming a bad position. Plaster-of-Paris is not very satisfactory, since it disintegrates rapidly when wetted with urine. The best material is duralumin, and details for the manufacture of simple splints are given in full in a recent paper by Seddon, Hawes, and Raffray (1946).

Maintenance of Mobility

As soon as the patient is afebrile and free from pain the affected part should be put through a full range of movement at least daily, and if possible twice a day; in this way contractures will be completely prevented. Oedema of a grossly paralysed part is seen occasionally and is due to sluggishness of the lymph flow, which, in turn, is dependent on muscular activity. There is no more potent cause of stiffness; and there should, therefore, be no hesitation in elevating the swollen limb and persevering with frequent passive movements until the oedema has gone.

Irritative Phenomena

So far poliomyelitis has been discussed simply as a paralytic disorder. In recent years attention has been drawn, especially by Miss Kenny, to irritative phenomena which, at any rate in America, seem to be fairly common. These manifestations of poliomyelitis, to which it is believed by some that peculiar significance attaches, may be described briefly as pain and muscle spasm. Pain as an early symptom of poliomyelitis is commonplace, but persistent pain either in the spine or in the limbs is rare in this country, and was found in very few cases in two of the Colonies —Malta and Mauritius—where grave epidemics of poliomyelitis have occurred in recent years. Apart from the purely subjective sensory disturbances that so frequently mark the acute phase of the disease, one may distinguish three kinds of pain which can be elicited by the examiner: (*a*) a muscle which may or may not be paralysed is sometimes found to be tender; (*b*) a muscle may be painful when stretched; and (*c*) a muscle may be in a state of spasm which is accompanied by more or less pain. Spasm of the spinal muscles is universally recognized as an early feature of the disease, and is undoubtedly a manifestation of meningeal irritation, disappearing rapidly as the inflammatory process in the cord subsides. Spasm in the muscles of the affected limbs is, however, a very different affair and exceedingly hard to explain. By some it is held to be an essential feature of the disease; I have seen persistent painful shortening of a muscle in fewer than 10 out of 1,500 cases, although we were on the look-out for it, and in none was there unequivocal spasm in the muscles of the limb. However, we cannot altogether ignore the few cases in which muscles remain tender or are painful on movement, since treatment of these patients is beset with peculiar difficulties. If regular mobilization of the joints and muscles is withheld until pain has subsided it may then be found that contractures have developed which are exceedingly difficult to correct. Yet if mobilization is attempted early, pain will be provoked as the extremes of movement are approached and the mobilization will be ineffective. For these reasons active steps should be taken to relieve severe pain of whatever origin, even moderate pain if it persists for more than ten days. The frequent application of heat is valuable; immersion in a warm bath is an old and reliable remedy, and encasing the part in hot moist packs is useful, though it involves considerable disturbance of the patient and is messy and time-consuming. At any rate, no effort should be spared to relieve the pain so that early mobilization of the limbs may be carried out.

An entirely different approach, for which Ransahoff, of New York, makes considerable claims, is the relief of pain associated with muscle spasm by the injection of curare. It is believed that muscle spasm or the slight shortening of muscles that causes pain when the muscle is stretched is due to irregular activity of the muscle, which in turn is caused by disordered action of certain of the affected anterior horn cells. However, it seems very doubtful whether curare is completely effective in relieving these painful muscle disorders, for in order to obtain full muscle length powerful and often exceedingly painful stretching of the muscles is necessary, and the method has not commended itself to those who have seen Ransahoff's patients under treatment. There is still much to be found out about the nature of the sensory disturbances in poliomyelitis and of disorders of muscle function other than simple paralysis.

Essential Features of Treatment

The essential features in the early treatment of weak and paralysed muscles in poliomyelitis are as follows:

1. Early determination of the extent and degree of muscle weakness. The extent of the paralysis should always be ascertained at about one week after its onset and then at intervals of two weeks until two months after the onset. Observations at intervals of a month will then be sufficient, and after six months at intervals of two months.

2. Maintenance of the paralysed part in what one may call a sensible position—the term "physiological position" is hardly apposite—should be undertaken from the first. This is the only reason for the application of splints.

3. In order to prevent stiffness of joints and contracture of muscles the affected part should be put through a full range of movement at least once a day, this treatment being started when pain has subsided or 10 to 14 days after the onset of paralysis, whichever period is the shorter.

4. If pain—either muscle tenderness, pain on stretching a muscle, or true muscle spasm—persists beyond this time, or if it is very severe in the early stages of the disease, relief may sometimes be obtained by the application of heat; and it will then be considerably easier to carry out the movements that are so essential for the maintenance of the limb in a healthy condition.

Re-education of muscles during recovery is outside the scope of this article.

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The Third Conference of Tuberculosis Workers, recorded in *Transactions of the Third Tuberculosis Workers' Conference held in New Delhi, March*, 1945 (New Delhi: Tuberculosis Association of India, 20, Talkatora Road; Rs. 4), was sponsored by the Tuberculosis Association of India. Lieut.-Gen. Hance, D.G.I.M.S., quoted the estimated tuberculosis death rate in Indian cities as 200–450 per 100,000 population. Dr. P. V. Benjamin proposed a five-year plan to provide each three-million unit of population with a clinic, a subclinic, and a 50-bed hospital, and each Province or major State with a large hospital, clinic, and training centre—accessibility rather than climate to influence the siting of institutions. A long-term programme was also outlined. Speakers discussed tuberculosis experience in wartime, mass radiography, chest surgery, and the teaching of tuberculosis work. The proceedings emphasize the vast size of the tuberculosis problem in this subcontinent: estimates of the number of active cases among its 400 million inhabitants were variously given as 2½ and 20 million. The smallest long-term target of 500,000 beds for tuberculosis should be considered against the present 75,000 hospital beds of all kinds. However, one cannot but feel that the most powerful factors in bringing about a decline in tuberculosis rates in the new India would be a general rise in living and nutritional standards resulting from radical changes in its industrial and agricultural economy, the liquidation of illiteracy, and the training of increasing numbers of doctors and nurses.

PENICILLIN THERAPY IN OPHTHALMIA NEONATORUM

BY

ARNOLD SORSBY, M.D., F.R.C.S.

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In an earlier communication (Sorsby and Hoffa, 1945) it was shown that penicillin locally is highly efficacious in ophthalmia neonatorum. Consistent results could be obtained when drops in a concentration of 2,500 units per ml. were used, lower concentrations being rather erratic in their effect. The frequency of application was also shown to be of significance (Sorsby, 1945a, 1945b). Clinical cure was obtained more readily when drops were used at half-hourly instead of at hourly intervals, and readier still when the intervals were reduced to five minutes. Any tendency to pus formation was then generally suppressed within half an hour to three hours (by the instillation of six to 30 applications). When there was no longer any discharge, instillation of penicillin drops was continued at half-hourly intervals for six to 12 hours. At the end of this time a clinical cure was usually obtained, and penicillin was continued hourly for 12 hours and two-hourly for a further 24 hours. It was found that all the common causal organisms of ophthalmia neonatorum, including the virus of inclusion blennorrhoea, responded to penicillin, though there appeared to be a varying degree of susceptibility of the different exciting organisms.

The present series of 232 cases were observed at the ophthalmia neonatorum unit at White Oak Hospital from May 8, 1945, to March 10, 1947.

Local Treatment with Penicillin in Watery Solution

at Five-minute Intervals

To the 25 previously reported cases treated at five-minute intervals 30 more can now be added. Table I sets out

TABLE I.—*Commercial Penicillin 2,500 Units per ml. at Five-minute Intervals Initially. Time taken for Clinical Cure: in Relation to Severity and Distribution of the Affection*

		No. of Cases	Clinical Cure in Hours for Each Case
Mild	Unilateral ..	2	2, 1
	Bilateral ..	5	½*, 2, ½, 7½, 17†
Moderate	Unilateral ..	6	2, 12, 35, 45, 21, 2½
	Bilateral ..	10	1, 68†, 2, 6½†, 68, 115, 6½*, 9, 6, X
Severe	Unilateral ..	4	45, 82†, 4½*, 44
	Bilateral ..	3	67, 6, 40

* Relapsed. Cured by sulphamezathine.
† Relapsed. Cured by a further course of penicillin.
X = Poor response. Cured by sulphamezathine.

these 30 cases in relation to severity and the time taken to obtain a clinical cure. It will be seen that four of the 30 failed to give a satisfactory response to penicillin, and treatment had to be completed by a course of oral sulphamezathine. Four other cases showed a mild relapse necessitating a further course of local penicillin therapy. A primary cure was thus obtained in 22 (73%) out of 30 cases, the time taken extending from 15 minutes to 115 hours, with an average of 24 hours for clinical cure and an additional 36 hours' treatment to consolidate the cure, or a total of 60 hours' treatment in all.

at One-minute Intervals

(*a*) *Penicillin in a Concentration of 2,500 Units per ml.*—As penicillin drops are rapidly washed out from the conjunctival sac a further series of cases were treated more intensively. Drops in the same concentration (2,500 units per ml.) were instilled at intervals of one minute. It became apparent that such intensive treatment gave a quick response and had to be maintained for only a relatively short time, as any tendency to pus formation was rapidly suppressed. In most cases there was no pus within 20 minutes, though the lids remained swollen and the eye was still moist. A series of 71 cases were treated by drops instilled at intervals of one minute for half an hour; subsequently six applications were made at five-minute, half-hourly, hourly, and, finally, two-hourly intervals. The time for clinical cure varied considerably in the different cases, but in no instance was there any anxiety about the state of the eye after the first 20 minutes of treatment. Some eyes became completely dry within a matter of two to three hours; others remained moist or showed stickiness of the lid margins for a much longer time. Table II

TABLE II.—*Commercial Penicillin 2,500 Units per ml. at One-minute Intervals Initially. Total Time of Treatment in Hours (for Clinical Cure and for the Subsequent Treatment to Consolidate the Cure): in Relation to Severity and Distribution of the Affection*

		No. of Cases	Total Time of Treatment in Hours for Each Case
Mild	Unilateral ..	9	35, 6, 21, 12, 21, 36, 36, 14, 62
	Bilateral ..	9	16, 29, 25, 12, X, 40, 16, 17, X
Moderate	Unilateral ..	12	22, X, 72, 31, X, 16, 21, 30, 24, X, X, 96
	Bilateral ..	23	21, 96, 21, 22, 36, 19, X, X, 29, X, 10, X, 22, 52, 31, 21, X, 21, 22, X, X, X, 53
Severe	Unilateral ..	5	39, 20, 44, 92, 47
	Bilateral ..	13	12, 24, 108, 40, X, X, 44, X, X, X, 20, 25, 29

X = Poor response. Cured by sulphamezathine.

sets out the total number of hours each case was actually treated. The time of treatment included at least 12 hours during which the eye was apparently normal. It will be seen that in 19 cases the response was not good, necessitating the use of sulphonamides to clear the condition. In the remaining 52 cases (73%) a primary cure was obtained, the total time of treatment ranging from six to 96 hours, with an average of 33 hours.

(*b*) *Penicillin in a Concentration of 10,000 Units per ml.*—As this work was proceeding pure (crystalline) penicillin became available. In view of the fact that the proportion of failures (27%) was still not insignificant, and that the eye tolerates pure penicillin in higher concentrations than previously employed (the highest tolerated concentration of commercial penicillin being 2,500 units per ml.), a further series of cases were treated at one-minute intervals with drops in a concentration of 10,000 units per ml., using white crystalline penicillin dissolved in sterile water. Table III shows the results obtained. It will be seen that

TABLE III.—*Pure Penicillin 10,000 Units per ml. at One-minute Intervals Initially. Total Time of Treatment in Hours: in Relation to Severity and Distribution of Affection*

		No. of Cases	Total Time of Treatment in Hours for Each Case
Mild	Unilateral ..	2	45, 72
	Bilateral ..	9	X, X, 46, 45, 48, 24, 45, X, 38
Moderate	Unilateral ..	8	48, 93, 48, 45, R, R, X, 72
	Bilateral ..	12	20, 46, 72, 48, 44, X, 48, X, 14, 50, 42, 5
Severe	Unilateral ..	—	—
	Bilateral ..	2	57, 34

X = Poor response. Cured by sulphamezathine.
R = Relapse. Cured by a second course of penicillin locally.

in this series of 33 cases six still required sulphonamide by mouth, and that two further cases showed a relapse, which necessitated a second course of penicillin therapy. The time taken over treatment in the 25 cases (76%) of primary cure ranged from 20 to 72 hours, with an average of 48 hours.

Considered in relation to the number of hours taken over treatment in those cases of primary cure, treatment with penicillin 10,000 units per ml. gave apparently less satisfactory results than treatment with drops of 2,500 units per ml., the comparative figures being 48 and 33 hours respectively. The significant fact is, however, that there were rather fewer poor responses or relapses in the series treated with the more concentrated drops—and this, as will be seen below, in spite of the high percentage of cases with inclusion bodies in this series (15 out of 33 treated with 10,000 units per ml. as against 16 out of 71 treated with 2,500 units per ml.).

Clinical Cure in Relation to Organism

The causal organisms seen in the 30 cases treated at five-minute intervals are shown in Table IV. Of the four cases requiring sulphonamides to complete treatment three were cases of inclusion bodies, which numbered 11; the fourth case was one of the five cases due to the gonococcus. All the cases due to *Staph. aureus, Staph. albus,* diphtheroids, *Str. viridans,* and Morax-Axenfeld bacillus—the remaining causative organisms in this series—responded to penicillin, though three (out of a total of 14) required a second course of treatment. These results are not dissimilar to those observed in the 25 cases previously recorded. Here there was one failure in the gonococcal cases, and one in the diphtheroid group. Three relapses were noted in the eight cases due to *Staph. aureus,* and one relapse in the three diphtheroid cases. Taking this group as a whole there were 55 cases, which included 15 cases due to virus and five due to diphtheroids. Of the 15 virus cases three gave a poor response to penicillin, and of the five diphtheroid cases three relapsed and required a second course of penicillin.

TABLE IV.—*Commercial Penicillin* 2,500 *Units per ml. at Five-minute Intervals Initially. Time Taken for Clinical Cure: in Relation to Causal Organism and Severity of the Affection*

	No. of Cases	Clinical Cure in Hours for Each Case
Gonococcus:		
Mild	1	½*
Moderate	4	1, 2, 68†, 2½
Staph. aureus:		
Mild	4	½, 7½, 17†, 1
Moderate	3	12, 2, 35
Severe	1	45
Staph. albus:		
Moderate	1	9
Str. viridans:		
Moderate	1	6
Diphtheroids:		
Moderate	1	6½†
Severe	1	82†
Morax-Axenfeld:		
Mild	2	2, 2
Virus presumed from presence of inclusion bodies:		
Moderate	6	68, 45§, 115§, X, 6½*‡, 21‡
Severe	5	67§, 6§, 40§, 4½*‡, 44

* Relapsed. Cured by sulphamezathine.
† Relapsed. Cured by a further course of penicillin.
‡ *Staph. aureus* also present.
§ *Staph. albus* also present.
X=Poor response. Cured by sulphamezathine.

The 104 cases treated intensively at intervals of one minute (71 cases with drops in a concentration of 2,500 units per ml. and 33 with drops of 10,000 units per ml.) show a total of 25 cases that required sulphonamide treatment because of a poor response to penicillin (Table V). The distribution of these 25 cases and of two further cases that relapsed is shown in Table VI. It will be seen that all cases due to *Staph. aureus* responded well, as did the three cases due to the Koch-Weeks bacillus. The two failures with gonococcus occurred with drops in the lower concentrations, as did three of the four failures with *Staph. albus.* Unsatisfactory response to diphtheroids appears to be equally distributed in the two series, four of the six cases falling in the 2,500 units per ml. group and two in the 10,000 units per ml. group. The most suggestive finding refers to the inclusion bodies. Of the total of 13 unsatisfactory responses nine occurred in the 16 cases treated by drops of a concentration of 2,500 units per ml., while only four were observed in the 15 cases treated with drops in a concentration of 10,000 units per ml.

TABLE V.—*Commercial Penicillin* 2,500 *Units per ml., Pure Penicillin* 10,000 *Units per ml., at One-minute Intervals Initially: Total Time of Treatment in Hours in Each Case in Relation to Causal Organism and Severity of the Affection*

	No. of Cases	Commercial Penicillin 2,500 Units per ml.	No. of Cases	Pure Penicillin 10,000 Units per ml.
Gonococcus:				
Mild	1	X	—	—
Moderate	2	31, X	5	48§, 45§, 46, 72, 48
Severe	6	20, 25, 29, 39, 20, 40	1	57
Staph. aureus:				
Mild	5	29, 25, 6, 21, 12	—	
Moderate	5	72, 21, 22, 36, 19	2	48, 20
Severe	2	24, 108	—	
Staph. albus:				
Mild	4	12, 21, 36, 36	3	X, 46, 45
Moderate	5	X, X, 16, 29, X	1	93
Streptococcus:				
Mild	1	16	—	
Pneumococcus:				
Mild	—		1	X
Diphtheroids:				
Mild	3	40, 16, 62	1	45
Moderate	8	10, X, 22, 52, 31, 21, 21, 30	4	44, X, 48, X
Severe	6	44, 92, X, X, 44, X	—	
Koch-Weeks:				
Mild	1	35	—	
Moderate	2	21, 96	—	
No organisms or inclusion bodies present:				
Moderate	2	22, X	—	
Severe	2	12, 47	—	
Virus presumed from presence of inclusion bodies:				
Mild	3	17§, X‡, 14‡	6	48, 24, 45§, 72§, X, 38
Moderate	11	24, X‡, X‡, 96, X††, 21‖, 22§, X‡, X‡, X†, 53	8	40*, 46*§, X, 72, 14, 50§, 42§, 54§
Severe	2	X, X	1	34

* Relapsed. Cured by a further course of penicillin.
† *Staph. aureus* also present.
‡ *Staph. albus* also present.
§ Diphtheroids also present.
‖ Gonococcus also present.
X=Poor response. Cured by sulphamezathine.

TABLE VI.—*Summary of Table V. Treatment at One-minute Intervals Initially: in Relation to Causal Organisms*

Organism	Total No.	Poor Response. Sulphonamides Needed	Relapse. Further Course of Penicillin Needed	Primary Cure by Local Penicillin	Average Total Time Treated (in 77 cases with primary cure)
Gonococcus	15	2	—	13	40 hours
Staph. aureus	14	—	—	14	33 ,,
Staph. albus	13	4	—	9	37 ,,
Streptococcus	1	—	—	1	—
Pneumococcus	1	1	—	—	—
Diphtheroids	22	6	—	16	39 ,,
Koch-Weeks	3	—	—	3	51 ,,
No organisms	4	1	—	3	27 ,,
Virus presumed from presence of inclusion bodies	31	11	2	18	41 ,,
	104	25	2	77	38 ,,

Penicillin in Vehicles other than Water

In an attempt to overcome the tediousness of intensive penicillin therapy at one-minute intervals other vehicles than water were tried in the hope that the penicillin so instilled would not be washed out from the eye as rapidly as is watery solution. The detailed results are shown in Table VII.

Lamellae.—In 14 cases lamellae were used containing 400 to 1,000 units of commercial penicillin. The excipient employed

TABLE VII.—*Distribution of Causal Organisms and Incidence of Primary Cure in 51 Cases Treated with Penicillin Locally in a Vehicle Other than Water*

Organism	Lamellae of Commercial Penicillin (400-1,000 U./g.)	Ointment with Commercial Penicillin (800–2,000 U./g.)	Ointment with Pure Penicillin (8,000–25,000 U./g.)	Pure Penicillin in Oily Suspension (10,000 U./ml.)	Pure Penicillin in 2% Methyl Cellulose Solution (10,000 U./ml.)
Gonococcus		1‡		2	
Staph. aureus	3			3	
Staph. albus	3			2	1
Pneumococcus					1
Diphtheroids	1	4	2	1	1
No organisms	2				1
Virus presumed from presence of inclusion bodies	5		5*‡	5†‡	8§
Total	14	5	7	13	12
Primary cure:	0	0	0	7‖	6¶

* *Staph. aureus* also present in one case.
† *Staph. albus* also present in one case.
‡ Diphtheroids also present in one case.
§ *Staph. albus* also present in three cases, diphtheroids in one, and *Str. viridans* in one.
‖ Three cases of inclusion bodies, one of diphtheroids, two of *Staph. albus*, and one of gonococcus.
¶ Four cases of inclusion bodies, one with no organisms, and one with pneumococcus.

was either lactose or a base specially prepared by Parke, Davis and Co. It was found that the instillation of lamellae in a baby with swollen lids was not particularly easy. Moreover, the lamellae either proved so readily soluble as to have no advantage over watery drops or were rather insoluble. The insoluble lamellae were often extruded from the conjunctival sac by the constant squeezing of the lids. Not a single clinical cure was obtained, and these babies all had to be treated with sulphamezathine.

Ointment.—In five cases commercial penicillin in watery solution containing 800 to 2,000 units per gramme were incorporated in "eucerin L.M." ointment base and used at two-hourly intervals. Here again instillation proved difficult; the ointment was frequently extruded and not a single cure was obtained. In seven further cases pure penicillin in a concentration of 8,000 to 25,000 units per gramme was used at two-hourly intervals. Only one cure was obtained, and this patient relapsed and had to be readmitted for sulphonamide treatment.

Oily Suspension.—Thirteen cases were treated with pure pencillin, 10,000 units per ml. in suspension of castor oil or liquid paraffin, instilled at five-minute intervals. Seven of these cases responded to treatment. One of the cases that did not respond did well when watery drops were instilled. The high incidence of poor response and the protracted course in the seven cases that responded to treatment led to the discontinuance of this experimental method.

Methyl Cellulose.—In 12 cases 2% methyl cellulose solution was employed as a vehicle for pure penicillin 10,000 units per ml. instilled at five-minute intervals. Six of these cases gave a poor response, necessitating sulphonamide treatment in five and watery penicillin in the other. Two of the six successfully treated cases remained irritable and subsided only when all treatment was discontinued. It appeared that 2% methyl cellulose is not free from irritation, though it has advantages over watery solution and might conceivably be developed to modify the one-minute treatment by watery drops.

Systemic Injection of Penicillin

As no suitable substitute for watery penicillin which would diminish the frequency of instillation seems as yet to be available, a series of cases were treated by massive systemic injections of penicillin. An empirical dose of 200,000 units, dissolved in 0.5 ml. of water, was injected into the buttock, the dose being repeated three times at three-hourly intervals, giving a total of 12 hours' treatment by systemic injection. This was followed by the instillation of drops of pure penicillin 10,000 units per ml. in 1% methyl cellulose solution, instilled at two-hourly intervals as long as the eye remained sticky. In most of the 39 cases so treated a tangible improvement in the state of the eye was seen within 15 minutes, pus formation being suppressed exceptionally within half an hour, generally within two to three hours, and occasionally not for five to six hours or even longer. Table VIII shows

TABLE VIII.—*Systemic Injections of Penicillin 800,000 Units, Four Injections of 200,000 Units each at Three-hourly Intervals. Total Time taken over Systemic Treatment and Follow-up Local Treatment: in Relation to Severity of the Affection*

		No. of Cases	Total Time of Treatment in Hours for Each Case
Mild	Unilateral	4	36, 38*, 33, 24
	Bilateral	7	24, 23, 12*, 60, 18, 52, 21*
Moderate	Unilateral	7	12, 6, 12, 24, 24, 48, X
	Bilateral	5	40, X, 48, X, 120
Severe	Unilateral	6	24, 46, 48, 30, 12, 21
	Bilateral	10	58, 40, 22, 48, 52, 42, 30, 40, 30, 54

* Relapsed. Cured by a course of local penicillin.
X = Poor response. Cured by sulphamezathine.

the distribution of the cases according to severity. It will be seen that three cases in this series required sulphonamide treatment, and three more a course of local penicillin treatment—10,000 units per ml. instilled at intervals of one minute. The significant findings are: (1) the low incidence of cases giving a poor response and requiring sulphonamide—three (7.7%) out of 39; (2) the low incidence of cases showing relapses—three (7.7%); (3) primary cure in 33 (84.6%) out of 39 cases; (4) the excellent response in five cases in this series—the response being so good that treatment was completed within 12 hours of intramuscular injection, so that subsequent penicillin drops were unnecessary; (5) the total duration of treatment in the 33 cases with primary cure was from six to 120 hours, with an average of 46 hours.

As can be seen from Table IX this series of 39 cases contained 17 that showed inclusion bodies and only two of

TABLE IX.—*Systemic Injections of Penicillin 800,000 Units (Four Injections of 200,000 Units each at Three-hourly Intervals). Total Time taken over Systemic Treatment and Follow-up Local Treatment: in Relation to Causal Organism and Severity of the Affection*

	No. of Cases	Total Time of Treatment in Hours for Each Case
Gonococcus:		
Mild	1	24
Moderate	1	24
Severe	2	48, 30
Staph. aureus:		
Mild	1	23
Staph. albus:		
Mild	1	12*
Severe	1	58
Str. viridans:		
Mild	1	36
Moderate	1	40
Diphtheroids:		
Moderate	2	X, 12
Severe	3	46, 22, 48
Koch-Weeks:		
Mild	1	38*
Severe	1	24
Friedländer:		
Mild		24
No organisms:		
Mild	2	60, 33
Moderate	2	12, 6
Severe	1	40
Virus presumed from presence of inclusion bodies:		
Mild	3	18, 52, 21*
Moderate	6	24, 48, X, 48, X, 120
Severe	8	12, 21, 52, 42, 30, 40, 30, 54

* Relapsed. Cured by a course of local penicillin.
X = Poor response. Cured by sulphamezathine.

these 17 cases required sulphonamide treatment, while only one relapsed requiring local penicillin therapy. Likewise of the five cases due to diphtheroids only one required sulphonamide treatment and none relapsed.

Discussion

Course of Affection in Primary Cure

The course of the affection varies somewhat with the different modes of application. With commercial penicillin, 2,500 units per ml. instilled at five-minute intervals, pus may be suppressed within half an hour, but generally up to three hours is required. Subsequently the eye does not become completely dry for a variable number of hours, while stickiness of the lid margin may persist for one or two days. With instillations at one-minute intervals pus is invariably suppressed within half an hour, while the eye remains moist and the lid margins may remain sticky for as long as two days, though recovery generally is rapid. It would appear that persistence of moistness and of stickiness of the lid margin is not altogether due to the infection, for occasionally suspension of all treatment has led rapidly to the clearing of these residual reactions. In individual cases it is often difficult to decide whether these reactions are the remains of an infection or the result of irritation from commercial penicillin. One of the advantages of pure penicillin has been that fewer cases present these residual symptoms. When intramuscular injections are used suppression of pus is not so rapid, but substantially fewer moist and sticky eyes are seen at the end of 24 hours. In all probability commercial penicillin in a concentration of 2,500 units per ml. is not devoid of irritative reactions in some infants, and it is possible that irritative reactions seen with pure penicillin may well be due not to the penicillin itself but to the constant handling of the lids that local therapy involves.

Relapses and Unsatisfactory Response

When relapses occur it is only exceptionally that the condition is as severe as it was initially: generally an eye that had shown clinical cure becomes either moist or shows sticky lid margins. In such cases a further course of local penicillin usually clears the condition, suggesting an activated latent infection rather than a condition which is the result of mechanical handling. The possibility of reinfection also arises. In two cases with unilateral infection satisfactorily treated by systemic administration the second eye became involved on the second and third days after cessation of treatment. Both these infants were nursed by their mothers, so that extragenital infection is not unlikely.

In contrast to relapses there are the cases that have initially shown an unsatisfactory response. It must be understood that this does not mean that the condition is not brought under control. In no single instance was there any failure in that sense. An unsatisfactory response means little more than persistent moistness of the conjunctiva and sticky lid margins with occasionally some oedema of the fornices. In no case did any complications develop after admission, and occasional cases admitted with a hazy cornea rapidly returned to normal. There was, however, one exception which is not included in the tables:

A baby aged 6 weeks was admitted with an ophthalmia neonatorum of four weeks' standing with both corneae heavily involved. One cornea perforated within two hours after admission, with extrusion of the lens. Intensive penicillin therapy rapidly brought the conjunctival infection under control, but appeared to have little effect on either of the heavily infiltrated corneae. After a protracted course of combined carbolization, penicillin, sulphonamide, and Kiton fast green V treatment the baby was ultimately discharged with a shrinking right eye and an extensively opalescent left cornea. No causal organism could be found in this infant, nor were inclusion bodies obtained.

As can be seen from Table X if relapses and unsatisfactory responses are counted as failures there were 15 failures out of 55 cases treated at five-minute intervals with penicillin 2,500 units per ml.—that is, the 30 cases recorded here and the 25 cases recorded previously. When treatment was instituted at one-minute intervals there were 26 failures out of a total of 104. The number of failures declined somewhat to six out of 39 when intramuscular treatment was instituted. Taking the series as a whole there were 47 failures in a total of 198 cases.

TABLE X.—*Summary Table Showing Results Obtained with Commercial Penicillin and Pure Penicillin Locally, and Systemic Penicillin in Relation to Causal Organism*

Mode of Treatment:	Drops at 5-minute Intervals (2,500 U./ml.)		Drops at 1-minute Intervals (2,500 U./ml.)		Drops at 1-minute Intervals (10,000 U./ml.)		Systemic		Total	
Organism	+	−	+	−	+	−	+	−	+	−
Gonococcus	7	3	7	2	6	—	4	—	24	5
Staph. aureus	12	4	12	—	2	—	1	—	27	4
Staph. albus	1	—	7	2	3	1	1	1	12	4
Diphtheroids	1	4	13	4	3	2	4	1	21	11
Str. haemolyticus	1	—	1	—	—	—	—	—	2	—
Str. viridans	1	—	—	—	—	—	2	—	3	—
Pneumococcus	—	—	—	—	—	1	—	—	—	1
Gram-negative diplococci	—	1	—	—	—	—	—	—	—	1
Friedländer	1	—	—	—	—	—	1	—	2	—
Koch–Weeks	—	—	3	—	—	—	1	1	4	1
Morax–Axenfeld	3	—	—	—	—	—	—	—	3	—
No organisms	1	—	3	1	—	—	5	—	9	1
Virus presumed from presence of inclusion bodies	12	3	7	9	11	4	14	3	44	19
	40	15	53	18	25	8	33	6	151	47

+ = Successful treatment.
− = Unsatisfactory response or relapse necessitating sulphonamide or further penicillin treatment.

Response in Relation to Causal Organism

From Table X it can be seen that the response with the less frequent exciting organisms, such as *Str. haemolyticus, Str. viridans,* Friedländer's bacillus, Koch-Weeks bacillus, and Morax–Axenfeld bacillus, was almost uniformly good, as was response in cases where no organisms could be established. In gonococcal infection response was distinctly better with drops of 10,000 units per ml. and with intramuscular injection than with drops of 2,500 units, whether instilled at five-minute or one-minute intervals. *Staph. aureus* gave uniformly good results with the one-minute treatment and intramuscular injection; there were four failures out of 16 treated at five-minute intervals. The most significant findings are with diphtheroids and virus infections. With each of the four different methods of treatment diphtheroids gave some failures: four out of five with the five-minute treatment; four out of 17 with one-minute treatment of 2,500 units per ml.; two out of five treated with drops 10,000 units per ml.; and one out of five with systemic treatment. Likewise there were 12 failures out of 31 cases of virus infection treated with penicillin in a concentration of 2,500 units per ml., but only four out of 15 when the concentration was 10,000 units per ml. and three out of 17 when systemic treatment was applied. It is clear from Table X that the two most resistant groups are infections due to diphtheroids and to virus, the incidence of failures for diphtheroids in the series as a whole being 11 out of 32 and for virus infections 19 out of 63. The failures were, however, largely concentrated in the groups treated by penicillin of 2,500 units per ml. The higher concentration of 10,000 units of pure penicillin and systemic injections considerably reduced the incidence of failures. As clinically there is nothing to distinguish one aetiological type of ophthalmia neonatorum from another, standard treatment must aim at overcoming

the most resistant organisms. For this reason penicillin drops in a concentration of 10,000 units per ml. are more desirable than lower concentrations, and it is possible that systemic injections are even preferable.

Choice of Method

For the present the choice of method in the treatment of ophthalmia neonatorum therefore lies between intensive local applications and massive systemic injections. So far as duration of treatment is concerned there is little to choose between the two methods. Intensive local treatment has the gratifying feature that pus is suppressed within 20 to 30 minutes; massive systemic therapy, though the suppression of pus is not so dramatically rapid, has the advantage of greater simplicity and perhaps greater efficacy.

Mode of Use

(*a*) *Intensive Local Therapy.*—(1) On admission a swab is taken for smear and culture, and the eye is irrigated with half-normal saline at room temperature. A drop of adrenaline, 1 in 1,000, is instilled, and a scraping is taken from the palpebral conjunctiva for examination for the presence of inclusion bodies. Atropine sulphate 1% is instilled if the cornea is involved. (2) Any pus that may have accumulated is wiped away with moist pledgets of cotton-wool, and two drops of pure penicillin in a concentration of 10,000 units per ml. are instilled. (3) The baby is now placed on the nurse's lap, while another nurse sitting near by instils one drop of penicillin solution every minute for 30 minutes. Irrigation is not needed, as pus does not form to any extent; such thin mucoid discharge as is present can be ignored, or, if it clings to the lid margin, wiped away with moist pledgets of cotton-wool. (4) At the end of this time there is invariably no pus and generally little or no discharge. The eye, however, is still moist, the lids still swollen, and the lid margins tend to be sticky. The baby is returned to its cot and instillation of penicillin drops is continued six times at five-minute intervals, followed by a similar number of instillations at half-hourly, hourly, and two-hourly intervals. This gives a total of 22 hours' treatment. Many cases require no further attention. (5) In some babies the lid margins still tend to be sticky. It is advisable in such cases to continue with penicillin at two-hourly intervals until the eye is dry, when treatment is continued for a further 12 hours.

(*b*) *Massive Systemic Injection.*—(1) Stage 1 is as with local therapy. (2) Any pus that may have accumulated during this preliminary procedure is wiped away with moist pledgets of cotton-wool. (3) An injection of 200,000 units of high-potency penicillin dissolved in 0.5 ml. of sterile water is made deep into the buttock, and the baby returned to its cot. (4) The injection is repeated after three, six, and nine hours. (5) At the end of this 12-hour treatment, during which time no local measures of any kind are carried out, most eyes are dry, though some babies still show sticky lid margins. Where there is any doubt as to a fully consolidated cure, pure penicillin 10,000 units per ml. in 1% methyl cellulose solution is instilled as drops into the eye at two-hourly intervals, and continued for 12 hours after clinical cure.

Comparison of Penicillin with "Marfanil" and "Gramicidin S"

Three cases were treated with marfanil locally and four cases with gramicidin S. Some improvement was obtained with both these agents but no cure, and treatment by a sulphonamide was necessary. The distribution of organisms and the mode of use in these seven cases are shown in Table XI.

TABLE XI.—*Distribution of Organisms in Cases Treated Unsuccessfully with Marfanil and Gramicidin S*

	Marfanil Drops at 1-minute Intervals for 10 Minutes		Gramicidin S. 4% Solution. Drops at 5-minute Intervals for 30 Minutes
	10%	25%	
	No. of Cases		
Staph. albus	—	2	—
Diphtheroids	1	—	—
Staph. aureus	—	—	3
Virus presumed from presence of inclusion bodies	—	—	1

Comparison with General Sulphonamide Therapy

As a standard method of treatment general sulphonamide therapy (Sorsby, 1945b) must now be regarded as obsolete, the results of penicillin therapy, whether by local or by systemic administration, being as strikingly superior to the sulphonamides as these in turn were to the classical methods. The sulphonamides are, however, invaluable as an alternative method of treatment when the response to penicillin is unsatisfactory. Moreover, for the present the sulphonamides still have the advantage of simplicity in administration over either of the two methods used with penicillin. Further simplifications of penicillin therapy and a reduction in the proportion of unsatisfactory responses do not, however, appear to be impossible.

Summary

1. In a series of 232 cases of ophthalmia neonatorum 224 were treated by penicillin in several different modes of applications. (*a*) Thirty cases were treated by instillation of watery drops of commercial penicillin in a concentration of 2,500 units per ml. at five-minute intervals initially. The good results recorded previously with a similar series of 25 cases were confirmed. (*b*) Seventy-one cases were treated with the same concentration of penicillin drops instilled at intervals of one minute for half an hour, and subsequently at less frequent intervals. In 19 cases the response to treatment was not good, or there was a relapse; the remaining 52 (73%) cleared rapidly, the total time of treatment needed being six to 96 hours, with an average of 33 hours. (*c*) Thirty-three cases were treated with more concentrated drops—10,000 units of pure penicillin per ml. Six cases gave an unsatisfactory response or relapsed, the remaining 27 (76%) cleared rapidly, requiring treatment for from 20 to 72 hours, with an average of 48 hours. (*d*) To obviate the need for frequent applications, oily or solid vehicles containing penicillin were tried out in 51 cases (lamellae in 14 cases, ointment in 12, oily suspensions in 13, and methyl cellulose in 12 cases). The results were unsatisfactory. (*e*) In a final series of 39 cases the initial local treatment was replaced by massive systemic injection (800,000 units in doses of 200,000 units at three-hourly intervals), followed on completion of the course by the instillation of pure penicillin 10,000 units per ml. in 1% methyl cellulose solution at two-hourly intervals. In 33 cases (84.6%) the response was good; in five of these the condition was cleared up by the systemic injections exclusively. The total duration of treatment in these 33 cases was from six to 120 hours, with an average of 46 hours.

2. Assessed against the causal organism the 30 cases treated by drops of commercial penicillin 2,500 units per ml. instilled initially at five-minute intervals gave four cases that required sulphonamide treatment. Of these four cases three showed inclusion bodies, of which there were a total of 11 cases. Both the cases in this series showing diphtheroids relapsed and required a further course of penicillin.

The 104 cases treated intensively at intervals of one minute showed a total of 25 cases that required sulphonamide treatment because of a poor response. Of these 25 cases 11 showed inclusion bodies and six showed diphtheroids; the remaining eight cases were distributed haphazardly among other organisms, though no failures were observed with *Staph. aureus*, streptococcus, and Koch-Weeks bacilli. There is nothing to suggest that the incidence of failures with diphtheroids could

be reduced by an increase in concentration of the drops, but a striking difference was noted in the case of inclusion bodies. Of the 16 cases of inclusion bodies treated by penicillin, 2,500 units per ml., nine gave an unsatisfactory response, while only four out of 15 failed to respond when the concentration was increased to 10,000 units per ml. Only one of the five cases with diphtheroids treated by systemic injection gave an unsatisfactory response; there were three cases with unsatisfactory response out of a total of 17 with inclusion bodies.

3. The poor responses and relapses recorded in this series are to be understood in a relative sense. A total failure to respond to penicillin treatment has not been observed, and in no case has penicillin treatment failed to influence the condition sufficiently to remove all anxiety within a matter of hours, or less. The optimum mode of use of penicillin is still to be determined, though even now the results obtainable are as great an advance on those of the sulphonamides as these in turn were over the classical methods of treatment.

I am indebted to Drs. Olga Bloom, Joan Haythorne, Joan Jenkins, J. Kennedy, R. E. O'Neal, K. B. Redmond, and C. Taylor for their help while they were residents at White Oak Hospital. I am also obliged to the matron and to Sister Condon and her staff for their loyal collaboration. To Dr. H. M. Walker, Dr. J. Ungar, Mr. J. T. Marsh, M.P.S., and Mr. W. A. Woodard, M.P.S., of Messrs. Glaxo Laboratories, Ltd., I am indebted for the supply of pure penicillin and much help in the preparation of oily suspensions and ointments.

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A FATAL CASE OF ACUTE PORPHYRIA WITH UNUSUAL FEATURES

BY

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The following case is worthy of record because of the difficulty in diagnosis and the possible relationship to drug therapy. The type of porphyrin was also atypical, and there were signs suggestive of adrenal insufficiency.

Case Report

A woman teacher aged 34 was admitted to hospital on the 9th day of a febrile illness which began with hoarseness and intermittent severe pains and weakness in all limbs. Except for appendicectomy some years ago and sinusitis a month before, she had been active and well until the onset of the present illness. She was an only child of parents, now dead, of whom she knew little. The limb pains subsided in two days, but on the 6th day she had lower abdominal pain with slight tenderness in the right lumbar area. No relief was obtained from an enema. A second was given with some success, but soon the abdominal pain increased with vomiting. Morphine, 1/4 gr. (16 mg.), had been given a few hours before admission.

On admission she was drowsy. The temperature was 100.5° F. (38.05° C.), the pulse 120, and the respirations 28. Pallor was evident but her general nutrition was good. The tongue was furred and dry. Slight tenderness was elicited in the right iliac fossa and hypogastrium. Rectal examination was negative. The lungs and heart were normal except for an exocardiac murmur at the mitral area. The blood pressure was 120/80. The central nervous system was normal, though the tendon reflexes were sluggish. The urine—specific gravity 1020—was red, evidently from admixture with menstrual blood; albumin was present, sugar absent. Pus and *B. coli* were found in a catheter specimen. She had no frequency of micturition, but the urinary findings, coupled with abdominal tenderness, suggested pyelo-cystitis. On the 11th day sulphamezathine was given, 2 g. at once followed by 1 g. four-hourly, together with potassium citrate, 30 gr. (2 g.) four-hourly. The temperature fell to normal after 24 hours, she felt and looked better, and the dose of sulphamezathine was reduced to 1 g. thrice daily. She received "soneryl," 1½ gr. (0.1 g.), and tab. codein. co. on several occasions.

On the 12th day of the disease there was mental confusion, with marked nocturnal restlessness and recurrence of severe pain and tenderness in the hypogastrium. Similar symptoms were present during the following night, and on the 15th day she had a fit, during which she bit and chewed her tongue. Her temperature was 98° F. (36.7° C.), pulse 104, and blood pressure 130/80. She could with difficulty be roused. Sulphamezathine was suspended after a total of 20 g. had been given, and potassium citrate was also stopped, half-normal saline being administered by mouth on account of suspected salt deficiency. Improvement rapidly followed and she became coherent and co-operative. The tongue was much swollen; cervical adenitis was present, and for this penicillin, 30,000 units three-hourly, was given intramuscularly. The abdomen was distended but not tender. The knee-jerks were sluggish, but other tendon reflexes were normal and weakness or sensory loss was not apparent. A skiagram of the chest and abdomen was normal. The C.S.F. showed: a pressure of 114 mm. of fluid, with less than 1 cell per c.mm.; protein 25 mg. per 100 ml.; globulin nil; colloidal gold test, 000000. A blood count showed: white cells, 30,000 per c.mm. (polymorphs, 89%; lymphocytes, 10%; eosinophils, 1%); plasma chlorides, 416 mg. per 100 ml.; serum sodium, 253 mg. per 100 ml.; urea, 25 mg. per 100 ml.; alkali reserve, 64 vols. CO_2 %. On the 17th day the blood chemistry was: chlorides, 470 mg.; sodium, 272 mg.; potassium, 14.9 mg.; alkali reserve, 61 vols. CO_2 %. It is of interest to note that the urine contained chlorides in spite of the low plasma chloride level.

On the 18th day porphyrin was discovered in the urine. Some general clinical improvement was apparent: the blood pressure was 110/80. The knee-jerks were now absent, but the ankle-jerks remained brisk and there was no weakness of the legs. Complaint was made of numbness of the lower abdomen, buttocks, and thighs, and objectively there was some loss of sensation to cotton-wool over the abdomen, but pin-prick was felt normally here and elsewhere. No postural or vibratory loss was noted at any time during the illness. Blood culture was negative. The white cells numbered 11,550 per c.mm. (polymorphs 80%). The urine contained a few pus cells only, and culture was sterile.

20th Day.—There was sudden deterioration during the preceding night. Her temperature was 101.5° F. (38.6° C.), and pulse 130; there were abdominal and limb pains, and mental confusion with phobias and delusions; a toxic appearance; a false rigor; and loss of all limb reflexes. The right kidney was palpable and tender and the exocardiac murmur was more pronounced. Half-strength saline was administered by mouth. Blood chemistry: chlorides, 494 mg.; sodium, 298 mg.; potassium, 14.7 mg.; urea, 24 mg.; calcium, 9.1 mg.

21st Day.—The temperature was 101° F. (38.3° C.) and the pulse 110. She was cyanosed and drowsy but co-operative. Diminished movement and breath sounds at the right base were believed to be due to a high diaphragm, as shown by a skiagram. The right kidney was tender.

22nd Day.—She was less cyanosed and more rational and co-operative. Temperature had fallen to 99° F. (37.2° C.). Examination revealed the following: weak abduction of shoulders; weakness of extensors of wrist and fingers; tendon jerks absent but sensation normal; weakness of legs, especially quadriceps; ankle- and knee-jerks absent but no more pain; abdominal reflexes absent; plantar reflexes flexor; analgesia to pin-prick over lower limbs and lower trunk, and anaesthesia to cotton-wool over trunk.

23rd Day.—Kaolin, 1/2 oz. (14 g.) three-hourly, was administered in the hope of its adsorbing porphyrin. On sternal puncture no abnormal cells were seen, but the marrow was very active, with a high count of neutral polymorphs and large

numbers of reticulocytes; 88% of normoblasts showed a cytoplasmic reticulum—a possible source of porphyrins. Ultra-violet light, applied to the skin and to the teeth, showed no fluorescence.

25th Day.—Now felt and looked well. Ankle-jerks brisk, but knee-jerks still absent. No sensory loss; no urinary symptoms or signs; B.P. 120/80.

31st Day.—She had gradually improved during the past few days, but her temperature was 100° F. (37.8° C.), for which no explanation was forthcoming; in particular there were no urinary symptoms or signs. The urinary output was good—3 to 5 pints (1.7 to 2.8 litres) per 24 hours. She received soneryl, 1½ gr. (0.1 g.), nightly until the 32nd and 33rd days, when "nembutal," 1½ gr. (0.1 g.), was given each night.

35th Day.—The patient complained of nausea with vomiting on one occasion, but she was able to sit up unaided. There was moderate weakness of the limbs, mainly proximal, but no demonstrable weakness at the ankles. The ankle-jerks had become sluggish once more and the knee-jerks were still absent. The upper-limb and the abdominal reflexes were not obtained. Though she was febrile—temperature 99° F. (37.2° C.) and pulse 116—the clinical impression was favourable. A few hours later she complained of an intolerable desire to bite her tongue, and she did so while lapsing into semi-consciousness, which deepened during the night.

36th Day.—At 6.30 a.m. chewing movements recurred and she remained comatose, with dilated but active pupils which showed hippus. The plantar reflexes were flexor. The pulse quickened to 140; the blood pressure fell to 80/60, and by 6 p.m. was 75/50. Her clinical state now suggested adrenal failure, especially in view of the blood chemistry, tachycardia, and hypotension. Serum sodium 248 mg.; potassium 18.8 mg.; urea 41 mg.; alkali reserve 60 vol. CO_2 %; chlorides 380 mg. Treatment by intravenous "eucortone" and 1.8% saline was given.

38th Day.—During the next 36 hours she received 4½ pints (2.6 litres) of double-strength saline and a total of 50 ml. of eucortone. After 16 hours' treatment the blood pressure began to rise a little to 80/55, and she very gradually improved and could be roused to answer "Yes" and "No." The highest blood pressure was 90/60 after 36 hours. Blood urea, 127 mg.; plasma chlorides, 576 mg.; blood sugar, 123 mg. Urine: albumin present, alkaline. *B. coli* present.

42nd Day.—Unable to cough (diaphragmatic paralysis), but intercostal muscles active. Voice weak, otherwise normal. Neck muscles unable to support head. Hand movements slight. Incontinent. Temperature 100° F. (37.8° C.), pulse 150/60. Blood urea, 277 mg.; chlorides, 680 mg.; alkali reserve, 57 vols. CO_2 %.

43rd Day.—Patient was cyanosed, with difficult respiration. She was put into an artificial respirator on account of intercostal and diaphragmatic paralysis. B.P. 75/60.

45th Day.—There was progressive paralysis of trunk and limbs but no cranial nerve paralysis; she was semi-conscious until death.

Post-mortem Examination (abstract)

The external appearances were not remarkable. The positive findings were: striking bluish-black discoloration of both rectus abdominis muscles, a few streaks in the psoas, and dark flecks on the parietal and visceral peritoneum of the lower abdomen and great omentum; distended discoloured sigmoid and rectum, containing greasy faeces. The liver was normal in appearance and weighed 51 oz. (1.45 kg.). The engorged kidneys were normal in size, the capsule stripped easily, and the right showed mild dilatation of the pelvis and pyelonephritis. There were purulent cystitis, oedema of mucosa obstructing the right ureteric orifice, and right hydro-ureter. The adrenals were normal. The right ovary contained a dermoid cyst with pale hair; other abdominal viscera were normal. The thyroid was atrophic, weighing only 9 g. No thymus was found. The lungs showed no effusion. The right lower lobe was almost completely consolidated, and section revealed a chequered pattern with alternating dark-red and dark-grey patches. The left lower lobe showed patchy collapse. The heart showed mild brown atrophy and slight irregularity of the mitral valve. The aorta was hypoplastic, with a diameter of only 1.5 cm. at the level of the coeliac axis. No coarctation was present. The brain and spinal cord were normal.

Red fluorescence under ultra-violet light was seen in specimens of costal cartilages which showed concentric rings, in sternal marrow, in the blackened portions of the rectus abdominis, in the posterior cusp of the mitral valve, in the septal endocardium, in the small intestine, in the medulla of the kidneys, and to a slight extent also in the adrenal glands.

Histology.—Detailed examination of the central nervous system disclosed nothing abnormal except vacuolation of the anterior horn cells. Some excess of lipoid pigment was present in ganglionic cells of the sympathetic, as well as oedema between nerve fibres and perineural sheaths and mild degeneration in the myelin sheaths. The lower lobe of the right lung showed infarcts at least one week old surrounded by supervening bronchopneumonia. Arterial thrombi were present, but otherwise no disease of the vessels was found. The liver showed mild fatty degeneration; the right kidney was in a state of low-grade pyelonephritis, there was complete necrosis of the whole thickness of the wall of the rectum, with only scanty leucocytic infiltration; and the adrenals exhibited slight degenerative changes, more marked in the deeper cortex. Microscopy of the other organs revealed nothing of importance.

Chemical Findings

The initial observation of porphyria was made by spectroscopic examination of a faintly pink specimen of urine on the 18th day of the disease. The two-banded spectrum of a metalloporphyrin complex was easily seen in a 1/2-in. (1.27-cm.) layer, the wavelengths being 577 and 541 mμ (Hartridge reversion spectroscope). On treatment with concentrated HCl the acid poryphyrin spectrum was obtained (594 and 551 mμ) and after neutralization with sodium acetate all the porphyrin was readily extractable by ether, giving a four-banded spectrum (623, 597, 575, 569 mμ). These wavelengths correspond closely to those given by Chandler, Harrison and Rimington (1939) for coproporphyrin derivatives measured with the same type of instrument. Subsequent specimens were collected into Winchesters containing HCl as preservative. It was noted that they were often normal in colour when passed but darkened to a reddish brown on standing.

The total daily urine porphyrin excretion, estimated by the method of Rimington (1943) on eleven 24-hourly specimens, is shown in the accompanying Chart. It will be seen that the

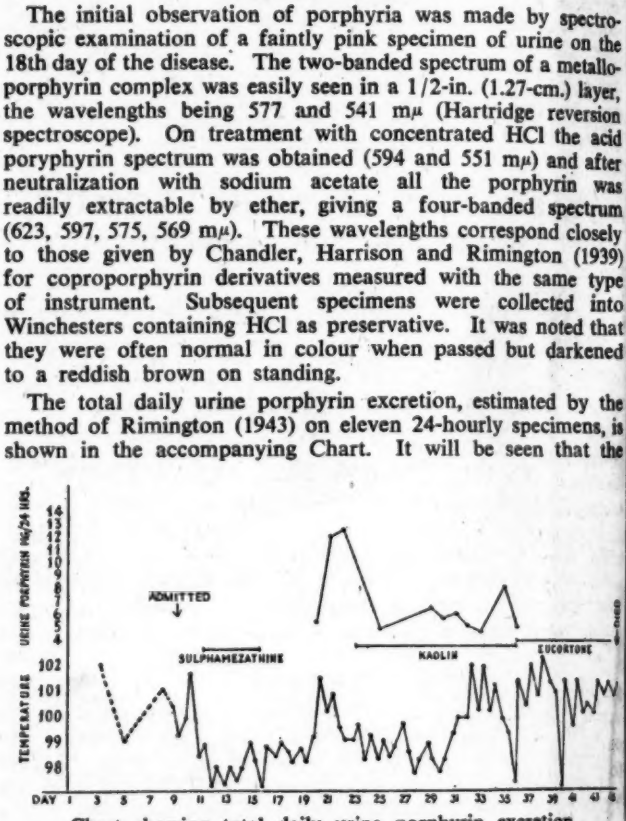

Chart showing total daily urine porphyrin excretion.

values fall between 4.7 and 12.5 mg. per day (normal up to 0.1 mg.), with some suggestion of a fall during the period of kaolin administration. No marked increase was noted at the onset of the fatal termination, but collection of complete 24-hour specimens became impossible at this time. The faecal excretion of coproporphyrin was determined fluorimetrically on a pooled 10-day specimen of stool collected from the 22nd to the 32nd day of the disease, and gave an average value of 50 mg. per day (normal up to 0.3 mg.). In this estimation the stool was first dried with acetone and then extracted with a mixture of ethyl acetate 10 parts to acetic acid 1 part. Extraction from ether into 0.25% w/v HCl was used to avoid the inclusion of protoporphyrin and deuteroporphyrin, which were present in small amounts.

Qualitative examination of the porphyrins by the methods of Dobriner (1937), supplemented by chromatography on alumina

showed that the urine porphyrins consisted of about 99% of coproporphyrin III (methyl ester, melting point 142° C., remelt 177° C.), and 1% of coproporphyrin I (methyl ester, melting point 254° C. corrected), with only traces of uroporphyrin. The stool coproporphyrin consisted of approximately 55% of coproporphyrin III (methyl ester, melting point 144° C., remelt 177° C.) and 45% of a coproporphyrin whose methyl ester melted at 163° C. This porphyrin could not be identified with any previously described, and is being further investigated.

The low serum sodium, potassium, and chloride levels and the terminal uraemia have been referred to above. The urinary 17-ketosteroid excretion was estimated on the 36th day of the disease and gave a normal result (12 mg. per 24 hours). The lead content of a 24-hour urine specimen was also within normal limits (0.11 mg. per litre). Liver function tests gave normal results—that is, serum bilirubin, 0.8 mg. per 100 ml.; serum alkaline phosphatase, 12 units; thymol turbidity test and serum colloidal gold reaction, negative.

Discussion

The principal difficulty in the diagnosis of porphyria lies in the comparative rarity of the condition, which therefore tends to be overlooked; in the present case the diagnosis was made more or less accidentally on the 18th day of the disease while the urine was being examined for another purpose. It would seem to be advisable to look specifically for porphyrinuria in any case of obscure abdominal pain associated with constipation, especially if accompanied by mental or neurological symptoms. The literature on porphyria will not be considered here in detail as it has been well reviewed by Chandler, Harrison, and Rimington (1939), Dobriner and Rhoads (1940), and Welcker (1945).

With regard to aetiology, the post-mortem finding of a hypoplastic aorta and an ovarian dermoid suggests the possibility of an inherited defect, but no useful family history was obtainable. The relationship of the porphyrin to drugs is by no means clear in this case. Porphyrinuria due to drugs (with the exception of the sulphonal group) usually produces less than 1 mg. per day of urinary *coproporphyrin* without symptoms directly attributable to the porphyrinuria except in lead-poisoning (Dobriner and Rhoads, 1940; Rimington and Hemmings, 1938). Acute idiopathic porphyria, on the other hand, usually produces an excretion of many milligrams of *uro*porphyrin per day with typical symptoms, and the porphyria of sulphonal poisoning is closely similar (Dobriner and Rhoads, 1940). The present case is therefore different from both these types, as there was a heavy excretion of *copro*porphyrin with typical symptomatology. It seems likely that the porphyria preceded the administration of any of the various drugs used, but the red colour of the urine noted on the ninth and tenth days of the disease was ascribed to menstrual blood, and no tests for porphyrin were made at this time.

The possibility of lead-poisoning seems to be ruled out by the normal urinary lead values and the absence of any history of exposure to lead. This case therefore appears to be intermediate between the drug porphyrinurias on the one hand and acute idiopathic porphyria on the other, having certain features in common with both groups.

In retrospect there is a distinct suggestion that the condition was aggravated by some of the drugs used, and the fatal termination followed closely on the administration of "nembutal," given to control the marked nocturnal restlessness. In this connexion the advice of Waldenström (1940) to restrict sedative drugs to opiates in this condition needs renewed emphasis, and it may perhaps be worth while to give the following list of drugs which are known to produce porphyrinuria and which should be particularly avoided. These are: sulphonal, trional, sulphonamides, barbiturates, arsenicals, alcohol, phosphorus, selenium, and lead (Dobriner and Rhoads, 1939). Kaolin was given in full doses for twelve days in an attempt to immobilize the porphyrin in the bowel, *in-vitro* experiments having shown that the urinary porphyrin in this case was well absorbed by kaolin. There was some clinical improvement, with a slight fall in urinary porphyrin excretion during this period, but the effect was not very definite. However, this line of treatment might be worth a trial in other cases.

The low serum sodium and chloride values found on three occasions are of interest, as these estimations do not appear to have been carried out previously in cases of porphyria. These changes were associated with tachycardia, hypotension, and collapse, and suggested adrenal involvement; but large doses of eucortone and sodium chloride failed to avert the fatal outcome, and no significant lesions were found in the adrenals at necropsy. During the exacerbations the resemblance to adrenal failure was, however, a striking feature, and the possibility of a purely functional adrenal disturbance should be considered as a contributory cause of death in porphyria. In this connexion it may be mentioned that the exact cause of death is not obvious in this condition, and that respiratory paralysis may not be the sole explanation in cases where efficient mechanical respiration is available.

Summary

The case is reported of a woman aged 34 who suffered from an illness lasting six weeks, characterized by four main exacerbations. The principal symptoms were fever, limb pain, weakness, abdominal pain, constipation, mental confusion, and epileptiform attacks. A urinary infection was present, and there were two episodes suggesting adrenal involvement. Death was preceded by progressive polyneuritis and respiratory failure.

The urine contained from 4.7 to 12 mg. of coproporphyrin a day, which was mainly coproporphyrin III. The stools also contained an excess of coproporphyrin III and an unidentified coproporphyrin.

The dangers of administration of certain drugs in this condition are discussed.

We are indebted to Dr. Alan Morgan for the necropsy findings, to Dr. J. G. Humble for the haematological details, and to Prof. C. R. Rimington for a sample of pure coproporphyrin I methyl ester. Mr. V. R. Wheatley gave valuable technical assistance.

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Practical Physiological Chemistry (twelfth edition), by Philip B. Hawk, Ph.D., Bernard L. Oser, Ph.D., and William H. Summerson, Ph.D. (J. and A. Churchill; 50s.), requires no introduction to British readers, but during the ten years that have elapsed since the last edition great advances have been made in biochemistry. The authors have produced a well-balanced, up-to-date, and comprehensive book without increasing the size unduly. They achieved more than the title suggests. There is a sound theoretical discussion of the subject matter of each chapter, followed by illustrative practical procedures, including a wealth of useful technical detail. New material includes accounts of electrophoresis, the use of isotopes and antibiotics, and metabolic antagonists. The chapter on vitamins has been extensively revised and expanded. The sections dealing with blood and urine analysis and energy metabolism are particularly useful to the clinical biochemist, for they include well-chosen descriptions of modern analytical techniques. The interpretations of pathological findings are brief but useful. The authors have wisely deleted obsolete material and included a chapter describing in detail the principles of colorimetry and photometry. This work will continue to retain its place in the laboratory as a practical manual and in the library as a valuable reference book.

HYPOGLYCAEMIA FOLLOWING PARTIAL GASTRECTOMY

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During a routine follow-up of 45 consecutive patients on whom a partial gastrectomy had been performed for peptic ulcer we noted symptoms of dizziness, palpitation, sweating, epigastric discomfort, and a feeling of weakness—progressing in several instances to complete loss of consciousness—in 17. These symptoms, coming on in from one-half to one and a half hours after food, were rapidly relieved by taking sugar or other easily assimilated carbohydrate. In this series they were far the commonest complication of partial gastrectomy, being greatly in excess of stomal ulcer and anaemia, which receive such a prominent place in the literature on the subject. Five of the patients were in consequence so severely disabled that they had become totally unfit for employment. Many of them, however, did not associate their symptoms with their operation, as their sensations seemed to be quite unconnected with the previous dyspepsia. In a follow-up of patients who have had a partial gastrectomy this syndrome may therefore be overlooked unless leading questions are asked.

Such symptoms have been noted previously, chiefly in the German literature by Lapp and Dibold (1933), Beckermann (1933), Koranyi (1936), and Wöhrle (1936). Evensen (1942) found that in 34 out of 95 cases of partial gastrectomy the blood sugar fell on occasion to less than 65 mg. per 100 ml. Adlersberg and Hammerschlag (1947), investigating the "post-gastrectomy syndrome," demonstrated a hypoglycaemic type of blood-sugar curve in all their 14 cases. There is a curious absence of reference in British literature to post-gastrectomy hypoglycaemia; the "dumping syndrome," however, is often mentioned, but is usually attributed to vagotonia, the result of jejunal distension from precipitate gastric evacuation.

TABLE I.—*Incidence of Hypoglycaemic Symptoms*

	Hypoglycaemic Symptoms		Asymptomatic		Total
	Male	Female	Male	Female	
No. of cases	12	5	24	4	45
Site of lesion:					
Duodenal ulcer	7	2	16	0	25
Gastric ulcer	5	3	8	4	20
Operation:					
Polya	12		18		30
Hoffmeister	5		10		15
Free acid in post-operative test meal	7		10		17
Age (years)	30–65 (average, 45·58)		32–65 (average, 42·61)		
Post-operative period (months)	4–84 (average, 33·29)		9–121 (average, 48·5)		

Table I shows the incidence of hypoglycaemic symptoms among our patients. It will be noted that their presence or absence bore no relation to the site of the previous ulcer, to the type of operation performed, to the presence or absence of free acid in the post-operative test meal, or to the age of the patient. On the whole the symptoms were more pronounced during the earlier months of the post-operative period.

Glucose tolerance tests were performed on all 45 patients. On the morning of the test a sample of fasting venous blood was withdrawn. The patient was then given 50 g. of glucose in 180 ml. of water orally, and samples of venous blood were withdrawn at 30, 60, 120, 180, and 240 minutes. In the latter half of the series an additional specimen was taken at 15 minutes. The sugar content of the blood specimens was estimated by the Hagedorn-Jensen method. Concomitant with the taking of the specimens the bladder was emptied and the urine was examined for sugar.

Illustrative Cases

Case 1.—The patient, a man aged 60, had been employed as a gardener until his operation (Polya) for a gastric ulcer eighteen months previously. For four or five years immediately

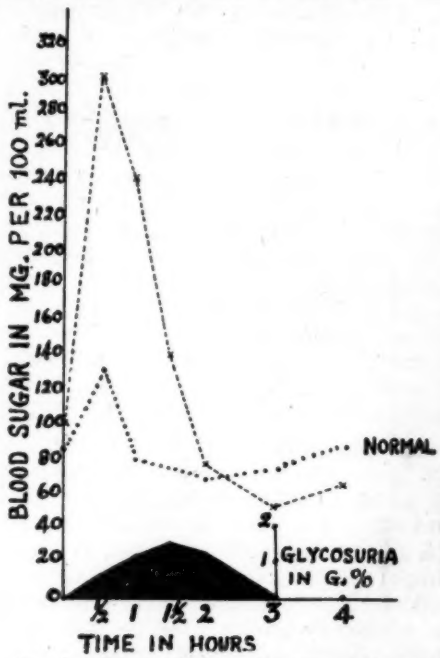

FIG. 1.—Case 1. Glucose tolerance curve. Note the sharp rise in blood sugar to 301 mg. and the fall to 53 mg., also a glycosuria of 1.6 g. during the peak of the blood-sugar curve.

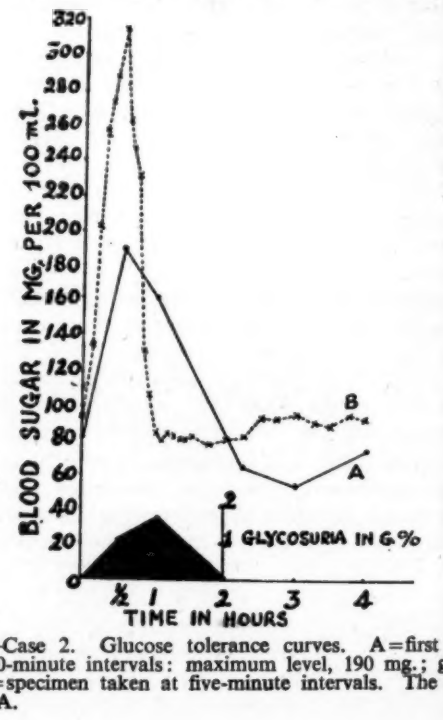

FIG. 2.—Case 2. Glucose tolerance curves. A=first specimen taken at 30-minute intervals: maximum level, 190 mg.; glycosuria, 1.8 g. B=specimen taken at five-minute intervals. The peak was missed in A.

before the operation he had lost one to two months' work each year because of pain and vomiting. Since the operation he has suffered from attacks of weakness, sweating, and dizziness one hour after food; these were intensified by taking exercise. Twice during such attacks he lost consciousness. He felt so weak and unsteady that he had not been able to return to work since his operation. A glucose tolerance curve is shown in Fig. 1.

Case 2.—A man aged 24 had had a Polya resection for duodenal ulcer nine months previously. Since the operation he had had severe attacks of hypoglycaemia half to one hour after meals. These were most pronounced after his afternoon tea, which consisted of tea with sugar, buns, and cakes. On one occasion, following a large carbohydrate tea, he boarded a bus, and instead of disembarking at his destination found himself at the terminus being wakened by the conductor. He was bathed in perspiration, felt very dizzy, and had extreme tachycardia. During a glucose tolerance test (Fig. 2, A) the highest reading was found to be only 190 mg. per 100 ml. in spite of a glycosuria of 1.8 g. %. It was therefore presumed that by taking specimens at 30 and 60 minutes the peak of the curve had been missed. On repeating this test, taking five-minute specimens, the peak was found to be 312 mg. (Fig. 2, B).

Discussion

Factors in the Production of Hypoglycaemia.—Three factors determine the production of hypoglycaemic symptoms—the maximum fall in blood sugar, the minimum level to which it falls, and the maximum rate at which it falls. These facts are illustrated in Table II, in which the figures

TABLE II.—*Average Readings of the Glucose Tolerance Curves*

	Hypoglycaemic Symptoms	Asymptomatic
No. of cases	17	28
Maximum fall	118·53 mg.	79·57 mg.
Minimum level	54·24 mg.	62·5 mg.
Maximum fall per minute ..	2·69 mg.	1·92 mg.
Maximum level	171·53 mg.	138·82 mg.
Glycosuria	52·82%	17·86%
Postprandial diuresis ..	47·05%	29·26%

given have been found to be statistically significant. It will be noted that the symptomatic cases show: (1) greater maximum fall, (2) lower minimum level, (3) greater maximum rate of fall, and (4) greater incidence of glycosuria and postprandial diuresis.

Physiological Basis for Post-gastrectomy Hpyoglycaemia.—It is a well-established fact that the gastric remnant after partial gastrectomy empties very quickly. This precipitous gastric evacuation is particularly marked following a meal rich in carbohydrate. Such food is rapidly absorbed from the jejunum, causing an abnormally brisk rise in blood sugar, sometimes to the extent of producing glycosuria. This in turn provokes an excessive secretion of endogenous insulin and a subsequent rapid fall in sugar concentration to an unusually low level. In nine of the cases showing symptoms of hypoglycaemia concentrations below 60 mg. per 100 ml. were noted. In the normal subject the stomach takes about three hours to empty. During this period food in small quantities is continually entering the jejunum, so that a less pronounced initial rise in blood sugar occurs. It must be confessed, however, that this theory does not explain the absence of hypoglycaemic symptoms following the rapid intravenous injection of glucose. Kalk and Meyer (1932) simulated post-gastrectomy conditions by intrajejunal intubation in a normal subject, and were able, by the administration of glucose through the tube, to produce the typical hypoglycaemic blood-sugar curve. A further observation by Evensen confirms short-circuiting to be the basis of the hypoglycaemia. He observed a high incidence of hypoglycaemia after gastro-enterostomy. In one such case the reconstitution of the normal alimentary tract immediately removed this abnormality from the glucose tolerance curve. A normal difference of the blood-sugar concentration in the capillaries and veins eliminates excessive tissue utilization or storage of carbohydrate as the cause of the hypoglycaemia. Further, in our cases a normal fasting blood sugar (average, 91 mg. per 100 ml.) and normal insulin tolerance curves rule out respectively excessive activity of the pancreatic islet tissue and undue sensitivity to insulin as causative factors.

The "Dumping" Syndrome (Dumping Stomach).—The symptoms of the so-called "dumping" syndrome are indistinguishable from those of postprandial hypoglycaemia, and it is probable that the two conditions are identical. There is no reason to believe that excessive vagotonia causes the syndrome, as is commonly held, since vagal stimulation would decrease the pulse rate, whereas tachycardia is present during the "dumping" syndrome. Again, atropine in full doses should inhibit the vagus, but it actually produces no alleviation of the symptoms. Lastly, Moore (1947) has recently reported a case of "dumping" following vagotomy in a patient with a subtotal gastrectomy. Upper abdominal discomfort and occasional vomiting, which have been reported as characteristic of the dumping syndrome, have been noted in some of our hypoglycaemic cases. It is well known that hypoglycaemia produces increased peristalsis; and a fall in blood sugar of sufficient magnitude to produce sweating, tachycardia, and faintness might produce not only increased peristalsis of the gastric remnant but actual spasm. Further, it is known that symptoms of the dumping syndrome often improve with time, and many of our hypoglycaemic patients gave a history of gradual improvement in spite of the persistence of hypoglycaemic blood-sugar curves, due no doubt to the gradual development of tolerance to low blood-sugar concentrations. We therefore believe that it is unnecessary to differentiate the two conditions, which are identical. If our theory is correct, that excessively rapid emptying of the gastric remnant into the jejunum is the primary cause of the dumping syndrome or postprandial hypoglycaemia, treatment should be directed to delaying the rate of gastric evacuation and jejunal absorption of sugar. We have in consequence, and with

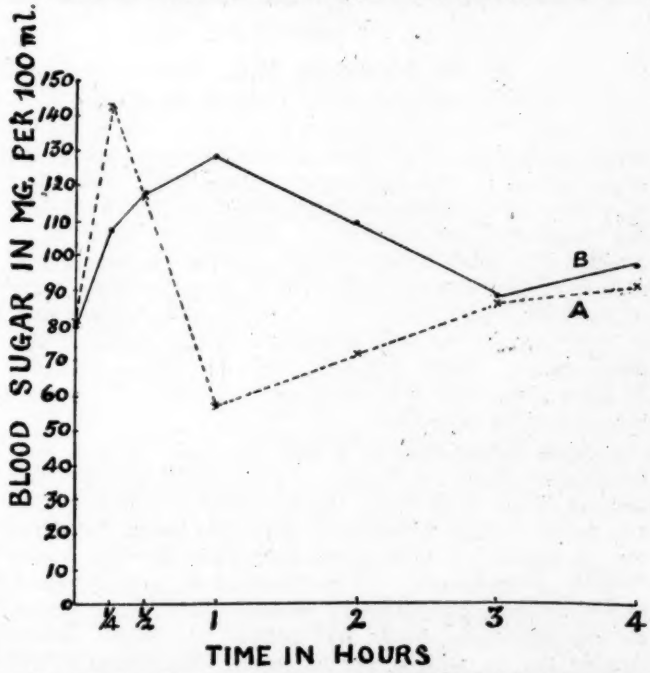

FIG. 3.—A = glucose tolerance curve without ephedrine. B = curve after 1/2 gr. (32 mg.) of ephedrine had been taken half an hour before the glucose.

some success, used high-fat diets or given 1 oz. (28 ml.) of olive oil before meals in the treatment of our hypoglycaemic cases. Ephedrine by its sympatheticomimetic action raises the blood sugar and has also proved useful in preventing reactive hypoglycaemia. It has been given in ½-gr. (32-mg.) doses half an hour before the three main meals. Fig. 3 shows its effect in a patient with moderately severe hypoglycaemia. Owing to their reduced gastric capacity these patients often feel better having six small meals a day instead of the usual three large ones.

Summary

Postprandial hypoglycaemia occurred in 17 out of 45 consecutive patients on whom a partial gastrectomy had been performed for peptic ulcer, and constituted the commonest complication of the operation in this series.

The symptoms produced were severe enough in five patients to preclude them from earning a livelihood.

It is suggested that rapid gastric evacuation is the basis of this hypoglycaemia, and that the "dumping" syndrome has identical clinical manifestations and an identical aetiology, so that the two conditions need not be distinguished.

The most effective method of treatment has proved to be a high-fat diet, six small meals a day instead of three large ones, and 1/2 gr. (32 mg.) of ephedrine before the three main meals.

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STATUS EPILEPTICUS COMPLICATING PREGNANCY

BY

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Status epilepticus in pregnancy is uncommon, but a few cases have been reported, most of them fatal. The effect of pregnancy on idiopathic epilepsy is variable, increasing the frequency and severity of the fits in some cases, ameliorating them in others, and in many instances producing no change whatever. Status epilepticus may occur at any time during pregnancy, labour, or the puerperium. It may even be the first intimation that an epileptic tendency exists. Often, however, the condition is preceded by more violent and more frequent fits, in spite of adequate anticonvulsant therapy.

A fatal termination is almost the rule, though very occasionally patients recover. Sachs (1910) reported two cases in sisters, both fatal. DeLee (1938), Greenhill (1934), and Sachs all state that death is inevitable unless the uterus can be emptied, a procedure which offers a very slender chance of recovery. Jardine records a case in which pregnancy was terminated by manual dilatation of the os, but to no avail. Sachs has packed the uterus before dilating the os, with a similar result. Bachmann (1930) states that, as in eclampsia, improvement is likely to occur immediately the pregnancy is terminated, but there can be no doubt that status epilepticus, though much rarer, is far more deadly.

Burnett (1946), in an excellent survey of the literature, has summed up the relation between epilepsy and pregnancy and the prognosis in status epilepticus in the pregnant woman. He reports a case which recovered after induction of labour by low rupture of the membranes under thiopentone anaesthesia in the thirty-third week of pregnancy. Although the child was not born for a further five days, complete recovery of the mother resulted and a live child was obtained. Two months after delivery the patient was having fits at her normal frequency.

Bachmann advises sterilization for any patient who has once suffered from status epilepticus in pregnancy, on the grounds that the chances of recovery are negligible should an attack be repeated in a subsequent pregnancy. Having regard to the rarity of the condition and the high mortality rate it is not possible to forecast the chances of a recurrence, but there would appear to be good reasons for supporting his view.

The following case is of interest, since recovery took place without interruption of pregnancy.

Case History

The patient, a married woman of 23, was admitted to the Royal Infirmary under the care of Prof. E. J. Wayne on Dec. 29, 1946, in status epilepticus; she was then three months pregnant with her first child. At the age of 21 she began to have major epileptic fits, and after full investigation idiopathic epilepsy was diagnosed. There was no family history of convulsive phenomena. She continued to have occasional fits, which were controlled with phenobarbitone. After one year's treatment, however, she ceased to take the drug, with the result that she went into status epilepticus for a few hours eighteen months before the present admission. She had taken no phenobarbitone during pregnancy, which so far had been uneventful and free from fits. Three days before admission she was married to the father of her child. Continuous convulsions began at 1 p.m. on the day of admission.

On examination she was seen to be a well-developed young woman, comatose, with stertorous respiration and slight cyanosis. The pulse was rapid (120) and of good volume, the blood pressure 130/70. There were no localizing signs in the central nervous system; the reflexes were absent, the plantar responses extensor. There was no oedema. The optic fundi, heart, lungs, and abdomen were normal. Vaginal examination revealed pregnancy of approximately three months' duration. The urine contained a trace of albumin but no sugar or acetone. The temperature was 98.8° F. (37.1° C.). She was incontinent of faeces and urine; there was no urinary retention.

Further generalized epileptiform fits followed in rapid succession at intervals of ten to fifteen minutes and lasted one to three minutes. No response was obtained to intramuscular sodium phenobarbitone, and it became necessary to give intravenous thiopentone to prevent a continuous succession of fits. Oxygen was administered continuously.

Sodium phenobarbitone, 3 gr. (0.2 g.), was injected intramuscularly twice daily and 0.25 g. of thiopentone was given intravenously as required. A lumbar puncture was performed and 10 ml. of clear fluid at a pressure of 160 mm. of water was removed. This manœuvre produced little relief, but it is probable that the increased intervals between fits were due to the barbiturates. On Dec. 29 she had seventeen major fits, and remained unconscious. Next day she had only four fits, but still remained unconscious. To control dehydration fluids were administered per rectum, and into the stomach through a transnasal tube. There were no other physical signs and no evidence of rising intracranial pressure. A further lumbar puncture was normal in all respects. On the 31st her general condition was much the same, but the temperature rose suddenly to 103° F. (39.4° C.) and the pulse to 130 at 2 p.m. She was still unconscious. During the day she had

twelve fits. Her lungs were clear. The blood urea was 41 mg. per 100 ml., the blood sugar 85 mg. per 100 ml., and the blood calcium 9 mg. per 100 ml. The cerebrospinal fluid contained 30 red cells per c.mm. but was otherwise normal.

On Jan. 1, 1947, she was still comatose and had 60 fits; the temperature was 101° F. (38.3° C.), and the respirations 22. Towards evening cough with sputum developed, moist sounds appeared at the bases of the lungs, and the respirations increased to 32. Penicillin, 30,000 units three-hourly, by intramuscular injection was started, and sulphamezathine, 2 g. at once and 1 g. four-hourly, was given through the gastric tube. Paraldehyde, 4 dr. (14 ml.), four-hourly per rectum was started. Phenobarbitone and thiopentone were discontinued. The white blood cells numbered 21,000 (81% polymorphs). Blood culture was sterile. The sputum showed *Staphylococcus aureus* and pneumococci. A catheter specimen of urine was sterile, and contained red cells and pus cells, a trace of albumin and sugar, but no casts. A skiagram of the chest was normal. On the 2nd her condition was deteriorating. Rectal paraldehyde was not retained; 3 dr. (11.5 ml.) was given four-hourly through a gastric tube. The temperature was 104° F. (40° C.), pulse 130, and respirations 40. During the day she had 25 fits. She was still comatose, and rales at the lung bases had increased. Mr. Glyn Davies advised against emptying the uterus.

On Jan. 3 her condition was slightly improved: there were no further fits and the coma was not so deep; the temperature was 100° F. (37.8° C.), pulse 130, and respirations 30. Paraldehyde was continued. A blood count showed: white cells, 9,200 (polymorphs 80%); haemoglobin, 73%; urea, 54 mg. per 100 ml. Next day her condition was steadily improving. She could be roused and was no longer incontinent. The temperature was 100° F., pulse 110, and respirations 30. There were no fits. On the 5th she was conscious and co-operative, but cerebration was slow. The temperature and respirations were normal, the pulse 110. She took fluids by mouth normally. Paraldehyde was reduced to 3 dr. six-hourly. On the 6th sulphamezathine was discontinued. She had no fits or symptoms and was fully conscious and sensible. The temperature, pulse, and respirations were normal. A catheter specimen of urine was sterile, and contained red cells and pus cells, a trace of albumin and sugar, but no casts.

On Jan. 9 the paraldehyde was discontinued. Phenobarbitone, 1 gr. (65 mg.), was given by mouth, three times a day. She had no fits. Skiagrams of the chest and skull were normal. On Jan. 16 the penicillin was discontinued. The patient was asymptomatic, and there were no abnormal physical signs and no fits. Next day her physical condition was excellent, but she became tearful and uncooperative. Clonic twitchings of the legs developed in the presence of any audience. She asserted that she could not walk. The character of these phenomena strongly suggested hysteria, and this diagnosis was confirmed by Dr. A. G. Yates. On Jan. 20 she was physically normal but grossly hysterical. She was discharged from hospital, under observation, on phenobarbitone, 1 gr. thrice daily. The pregnancy had remained undisturbed throughout in spite of continuous coma for six days and a total of 128 fits in hospital and an unknown number before admission.

Subsequent Progress

On June 6 the patient was feeling perfectly well, walking normally, with no signs of hysteria. She was taking phenobarbitone as instructed, and there had been no further fits.

On July 21 she was delivered of a normal female child weighing 8 lb. 2 oz. (3.7 kg.) by spontaneous delivery at term. There were no fits during labour, and both mother and child are progressing satisfactorily.

Discussion

This case differs in several important respects from the one described by Burnett. In our patient status epilepticus had occurred previously, when the patient was not pregnant and had omitted her phenobarbitone; it occurred at the end of the first three months of pregnancy, during which period she had taken no anticonvulsant drugs whatever. Burnett's patient had never previously had status epilepticus, which developed in the last three months of pregnancy in spite of regular anticonvulsant therapy. There does not seem to have been any question of eclampsia. Finally, termination of the pregnancy was not required in our case.

These differences suggest that the prognosis may be better when omission of specific therapy is a complicating factor than when status epilepticus intervenes in pregnancy despite previous adequate therapy. In our case it may well be that failure to take the necessary amount of phenobarbitone was alone responsible for the condition, but it would appear that the pregnancy exerted an additional malign influence, since this attack was far more severe than the previous one.

It is probable that the profound changes in hormonal balance with intracellular fluid retention which occur in pregnancy may lead to a slight degree of cerebral oedema sufficient to "fire-off" an excitable cortical focus. It is a well-known fact that some epileptics experience more fits at the menstrual periods than at other times, or may have fits only at those times.

In future cases of status epilepticus in pregnancy careful inquiry should be made concerning previous anticonvulsant treatment, as this point may prove an aid to prognosis and therapy. It is possible that onset in the early months of pregnancy may indicate a better chance of recovery than onset in the later months, when latent toxaemia of pregnancy may be an additional factor.

We wish to express our thanks to Prof. E. J. Wayne for permission to publish this case and for helpful criticism. We would also like to thank Mr. Glyn Davies and Dr. A. G. Yates for their help.

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DISCONTINUOUS INTRAVENOUS INFUSION AND TRANSFUSION

ADVANTAGES AND TECHNIQUE

BY

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Working as I do to a large extent in small hospitals and nursing homes without a resident medical officer, I have found the following expedient a godsend. The principle is founded on Edwards's vein-seeker. The outfit (Fig. 1), improvised with materials that are not difficult to obtain, was evolved with the assistance of Sister Pauline, C.B.E. It is of cardinal importance that the tubing be latex or other really good rubber. Most rubber tubing supplied to-day, particularly that made from synthetic rubber, has been found to be useless and dangerous for this purpose. Another essential point is that the rubber tubing must be renewed each time the apparatus is sterilized by boiling, and each time it is renewed the tubing must be tied securely

FIG. 1.—Showing the relative sizes of the components.

on to the glass connexion. The cannula is my pattern gold-plated cannula, preferably but not necessarily the child's model. I use a cannula because it can indubitably be tied into a vein, and it withstands the hazards of displacement to which experience shows it may be subjected; in short, it is almost foolproof. The bulb, tubing, and cannula are filled *completely* with 3.8% citrate solution. The cannula is tied into a vein in the usual way. The bulb is slightly compressed and released, and blood appears in the glass window (Fig. 2). Every four to six

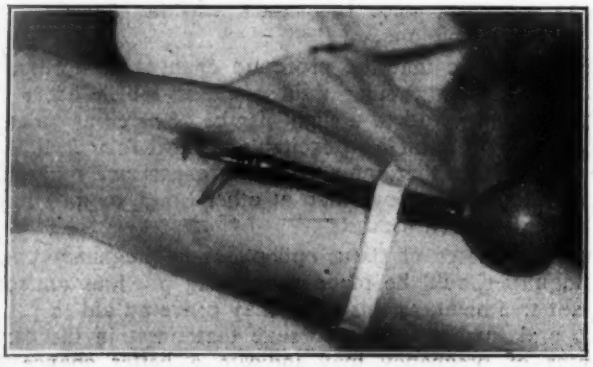

FIG. 2.—The apparatus in place. Especially when inserted into a vein of the forearm or the saphenous vein above the ankle, it can remain in position for four or five days without discomfort or the occurrence of thrombosis.

hours the bulb is *slightly* squeezed and released by the nurse in charge, and through the window it is noted whether the blood moves to and fro. It is possible to keep the cannula *in situ* for days, ready for immediate use when required. Any State-registered nurse can gently wipe the latex tube with alcohol and insert a hollow needle into the lumen of the rubber tube (Fig. 3). So it comes about

FIG. 3.—A hollow needle linked to an infusion or transfusion set can be inserted, withdrawn, and reinserted by the nurse in charge according to the orders she has received.

that saline solution, glucose solution, plasma, matched blood (if left in readiness), isotonic sodium sulphate solution, heparin, or any intravenous medication can be ordered at any hour on the telephone by the surgeon or physician, who may be miles away. This is the first advantage, and one that many will appreciate.

What I believe is a more important consideration is that if only this method of vein cannulization could be adopted in all cases where it is judged that the patient may need parenteral fluid for more than a period of six hours, I am sure many lives would be saved, for orders could be given to stop the infusion at a stated time. Patients would therefore be given a chance of disposing of fluid. Should they need more in a matter of one, four, or six hours, they can have it at once by simply inserting a hollow needle through the tubing.

What a safeguard this is! Instead of, through some mischance, the drips running for days without due checking as to whether the patient is in need of fluid, he would receive only such parenteral fluid as had been specifically ordered by the physician or surgeon in charge of the case.

In all seriousness I suggest that if hospital authorities gave orders that this simple apparatus must be employed in every case of intravenous infusion and transfusion, that it must be withdrawn at the end of 24 hours, and that it should be reinserted only after the house officer has consulted his chief, the registrar, or the resident medical officer, a great blessing would be conferred on the community.

Medical Memoranda

Epithelioma Complicating Lupus Erythematosus

Cases of epithelioma complicating lupus erythematosus are still rare enough to warrant being placed on record. According to Pringle (1900) the condition was first mentioned by Riesmayer, of St. Louis, in the *St. Louis* (U.S.A.) *Courier* of 1886. This

FIG. 1.—Photograph taken in March, 1946, showing keratinized warty growths.

original article is untraceable, but the title "Epithelial Cancer on Lupus Erythematosus," which Pringle quotes, appears convincing in its correctness. Pringle's own case was first seen by him in 1890—a woman aged 36 suffering from lupus erythematosus of the face and scalp. Seven years later a new feature in the case presented itself: "a raised, nodular, hard, irregularly outlined growth, with elevated, punched out, underlined margins and ulcerating centre, situated in the posterior parietal region and about the size of a five-shilling piece." This was freely excised, and histologically was found to consist of a squamous-celled carcinoma. The next fifty years brought to light further cases, and in 1929 Durand made a most exhaustive review of the subject. This was brought up to date by Beeson and Ehert.

Clinically the cancer appears most often as a vegetating or ulcerative lesion. Histologically the prickle-celled group is

nearly always involved. The fixed type of lupus erythematosus is the one most frequently complicated by epithelioma, the fleeting subacute or acute type generally escaping. It tends to appear in the scar tissue, and this dense, sclerotic, resistant tissue walls it off and accounts for the slow course of the disease. Adenopathy is usually late. Durand states that it is more common in males than in females, roughly in the proportion of 3 to 1. He also states that the average age of onset is 51 years, the average interval before its appearance 19 years, and the most favourable period between 30 and 60 years.

Keutzer has considered the aetiology of the disease from three standpoints: (1) that the combination of lupus erythematosus and cancer is accidental; (2) that the many treatments for such a chronic disease as lupus erythematosus (*x* rays, radium, CO_2 snow) provoke the cancer; and (3) lupus erythematosus itself may give rise to the degeneration. The first of these cannot altogether be eliminated. Durand considers that *x* rays and radium can be incriminated in only 35%. Since over 100 cases have been described in which neither of these agents was used, it is a reasonable theory that the inflammatory changes which precede the atrophy of lupus erythematosus may lead unaided to epithelioma. The prognosis in these cases is not good, and Beeson and Ehert consider that wide excision is best. Alternatively, *x* rays and radium can be combined with surgery.

FIG. 2.—Photograph of the patient taken on June 5, 1946.

REPORT OF A CASE

In November, 1926, a man aged 22 first attended the skin department of the London Hospital, under the care of Dr. O'Donovan. His family history revealed nothing of value. On examination a fixed erythema with superficial white scaling of the nose and orbits was seen. Treatment consisted of CO_2 snow, calamine lotion, and 1 gr. (65 mg.) of quinine sulphate thrice daily. In July, 1927, slight scarring of the left lobule occurred, and treatment was continued until July, 1928. In March, 1930, he had butterfly extension over the face, with both ears involved. This was treated by radium plate to all areas, piece by piece. In September, 1934, his own doctor began a series of fortnightly injections of "bismostab." From December, 1934, to January, 1936, the radium plate was applied to all areas. In March, 1938, the lesions were improved, and the improvement was maintained until June, 1943, when a few fresh lesions appeared on the nose. All lesions were treated with CO_2 snow. A series of fifteen injections of bismostab given by his own doctor was completed in April, 1944. In the August there was no change, and three months later he had a course of "myocrisin" injections. In April, 1945, a small wart appeared on the lobule of the right ear, and was treated with 10% salicylic acid ointment. Next month podophyllin in oil, 25%, was applied to the wart. In March, 1946, four keratinized warty growths appeared over the region of the lobe of the right ear and on to the adjoining skin of the cheek and neck—clinically squamous carcinoma type (Fig. 1). The patient was referred to the radiotherapy department of the London Hospital, where the diagnosis was confirmed and the epithelioma was treated with *x* rays. On June 5, 1946, the area was quite healed and there was no sign of epithelioma (Fig. 2).

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Status Epilepticus after Electric Convulsion Therapy

The following report of a rare complication of electric convulsion therapy is worthy of record.

CASE HISTORY

A married woman aged 60 was admitted to hospital on Sept. 28, 1946, in a state of reactive depression. She was retarded, was not eating her food, and was confused, apathetic, and fidgety. She gradually improved, and at the time of her discharge on Nov. 23 (made at the request of a relative) she was able to take part in the activities of the ward. She was due to have E.C.T., but the machine was out of action during her stay in hospital. Her heart had been examined by a speciaiist and considered sound. With a change in the domestic circumstances she relapsed, and her consultant advised E.C.T. as an out-patient.

Treatment began on Jan. 24, 1947, and was given twice weekly. It was on a subconvulsive basis, as a number of cases had been successfully treated in this manner. The first application was 0.2 second, 80 volts. The voltage and time were gradually increased each week. Her improvement was not as one could have wished; therefore with the eighth and ninth treatments (0.4 second, 100 volts) convulsions were produced. A definite improvement in her mental state was noted by her relatives. The tenth treatment, on Feb. 25 (0.4 second, 100 volts), did not cause a convulsion. She lost consciousness, recovered rapidly, and was very alert afterwards.

Just over an hour later, while on her way home, she felt faint, and on alighting from a bus collapsed and had a convulsion. She was moved into a house near by and four more convulsions followed. She recovered consciousness about two hours later, at 8 p.m., and was removed home by ambulance at 8.30 p.m., remaining drowsy. The convulsions began again at 9.30 p.m., and after being seen by her consultant she was admitted to hospital at midnight in a comatose condition, having had eight convulsions. A ninth occurred on admission. Pethidine, 50 mg., was given intramuscularly and the convulsions ceased for just over two hours. They then started again, and 35 convulsions followed at approximately ten-minute intervals. Hyoscine, 1/200 gr. (0.32 mg.), was given at 3 a.m., 4 a.m., and 6 a.m., with little benefit. At 8.45 a.m. an amyl nitrite capsule was broken under the nostrils; this was followed shortly by 3 gr. (0.2 g.) of soluble phenobarbitone intravenously. No further convulsions occurred from this time until her death in coma about thirty-six hours later. Her pupils remained fixed and dilated, acetone was detected in her breath, and air hunger was prominent at times. The temperature, pulse, and respirations were all raised, the temperature mounting to 104° F. (40° C.) on three occasions. Glucose and salines were given intravenously during the thirty-six hour comatose state preceding death, and for a time she improved. Digitalis was given hypodermically. However, her condition deteriorated and she died at 11.25 p.m. on Feb. 27.

A post-mortem examination was made by Dr. Janes at the Royal Sussex County Hospital, Brighton, on March 1. He detected multiple minute haemorrhages confined to the right side of the brain. Purulent bronchitis and terminal hypostasis were also present.

I am indebted to Dr. Alexander Watt for help in the preparation of this report and for permission to publish.

A. FOLKSON, M.B., B.S.

Reviews

CRIMINOLOGY

Introduction à la Criminologie. Volume I. Second edition. By Dr. Etienne De Greeff. (Pp. 416. No price given.) Brussels: Joseph Vandenplas, 73, Rue de la Croix de Fer. 1946.

The first edition of this work, published in 1937, was intended to meet the requirements of the elementary course at the School of Criminal Science at Louvain. The present edition is enlarged and is written for those who are concerned with criminological problems but have neither the time nor opportunity to obtain the material for themselves. The author has revised many chapters, and added to others. We are also led to expect in Vol. II a chapter by Mlle. J. Tuerlinckx, welfare worker for 10 years to the Louvain prisons, on the social rehabilitation of offenders, and a copious bibliography by Mlle De Clerck for those who wish to obtain first-hand knowledge of particular aspects of the subject.

The introduction presents a general outline of criminology and refers to the earlier writers—Lavater, Gall, Esquirol, Pritchard, Lauvergne, Lombroso, and others. The author pays tribute to the late Dr. L. Vervaeck, who will be remembered in Britain by those who attended the IXth International Penitentiary Congress in London in 1925, for his emphasizing the importance of the methodical study of the causes of crime and of the offender's individual reaction. The author considers at some length the correlations and rhythms of criminality associated with illiteracy, economic factors, social changes, alcohol, divorce, the Press, and the cinema, and reviews them statistically. He discusses locality, family life, and grouping in an interesting chapter and the modification of the environment. He presents the comparative anatomy of the criminal on the usual lines as well as the effect of age, sex, race, hybridization, and drug addiction. The Belgian figures relating to age show that in 1907 the highest number of male offenders were in the age group 21–25 years. Perhaps recent figures would compare more closely with those found in England and Wales thirty years later when the number of male offenders per 100,000 of the population was highest in the age group 12–16 years (see *Criminal Statistics*, 1937). The author briefly refers to the difficult, important, and much neglected study of the effect of religion on crime, and in an important chapter discusses the mentally unbalanced offender. The final chapter, on homicide, occupies more than a quarter of the volume.

This book is an authoritative presentation of the work of the Louvain School. The Belgian criminologists have long been respected in Britain for their earnest and enthusiastic studies. Dr. De Greeff's book increases our admiration.

W. NORWOOD EAST.

SPLENIC PUNCTURE

Die Milzpunktion. By Dr. Sven Moeschlin. (Pp. 205; illustrated. 30 Swiss francs.) Basle: Benno Schwabe. 1947.

After the first world war biochemical and quantitative techniques came to displace cytology in the study of diseases of the blood. The stream of researches which flowed from Ehrlich's discovery of tri-acid staining had finally ended in a morass of controversy. The methods of vital staining and tissue culture proved less fruitful than had been anticipated. The death of Naegeli and the emergence of the American school of haematology marked the end of an epoch. Looking back, we can see two reasons at least for the impasse of cytology. Professional haematologists had concentrated their attention too exclusively on the peripheral blood, and they were prone to rely on observation rather than experiment, on the single picture rather than the sequence of disease. There are now signs of a revival of interest in cytology and of a reunion of cytology and biochemistry in the intimate study of the blood cells. Sternal puncture has become an indispensable method of diagnosis. Biological researches on the nucleus and the chromosomes, on the effects of *x*-rays and radio-active materials, and on the chemotherapy of cancer and leukaemia have focused attention once more on the cell and have suggested that the blood cells in man are still a proper object of study with the microscope.

We have previously reviewed (Feb. 2, 1946, p. 165) Leitner's extensive work on sternal puncture. A companion volume on splenic puncture has now arrived from Zürich. Moeschlin describes his technique in detail and records 180 punctures without a mishap. The operation is carried out under local analgesia with a modified lumbar puncture needle. The main precautions are that the spleen should be enlarged, there should be no haemorrhagic tendency, and the operation should be carried out with the patient in full inspiration. Splenic puncture smears include material from the splenic pulp, the Malpighian follicles, and the blood. The lymphatic tissue of the follicles spreads less uniformly than the other material, and the smears are therefore less homogeneous than films of the peripheral blood or sternal marrow. The cells of the spleen can be classified into mature blood cells and cells of the reticulo-endothelial series, the lymphatic series, and the developing myeloid series. It is the opportunity of studying the reticulo-endothelial and lymphatic series which makes splenic puncture specially useful, and Moeschlin describes these cells in considerable detail. The proportion of reticulo-endothelial cells is small, and, though it is possible to define a normal splenogram in the same terms as a normal differential white blood cell count or even a normal differential marrow count, it is desirable to examine the whole of one or two films to get an idea of the cell constituents.

Moeschlin's material is entirely non-tropical, but within its range it is complete. He fully describes the splenogram in health and in the various groups of blood disorders. He recommends that splenic puncture should always be supplemented by sternal puncture. In diagnosis the method is most useful in the obscure leukaemias and reticuloses. Perhaps the most interesting section is that on the splenogram in leukaemia and the different effects of *x*-rays, arsenic, and urethane on the spleen and the bone marrow. It is probable that in temperate zones splenic puncture will be most used in investigations of this type. There are two coloured plates and 119 clear illustrations, mainly photomicrographs. The text is detailed but well organized and not particularly heavy reading. The book is well produced and not unduly expensive. It is a credit to the Swiss school of haematology. Some of us who drew our first inspiration from Naegeli will be stimulated by Moeschlin's book to increase the range of our observations on the blood-forming organs.

L. J. WITTS.

TEXTBOOK OF FORENSIC MEDICINE

Forensic Medicine. By Keith Simpson, M.D. (Pp. 335; 114 figures. 16s.) London: Edward Arnold. 1947.

This is a textbook for medical students by the lecturer in forensic medicine at Guy's Hospital. A brief introduction is followed by chapters on the signs of death, post-mortem changes, identification, and blood stains; six chapters on injury; and one chapter on each of the following subjects: infanticide, abortion, sexual offences, legal procedure, the medico-legal necropsy, the general legal obligations of the doctor, and insanity from the forensic standpoint. In the last twelve chapters—about a third of the book—he discusses toxicology. The author is a medico-legal specialist of wide experience and took the advice of other experts; his book is therefore accurate and up to date. Medical students will find it more than sufficient for examination purposes.

It is the author's aim "to give the subject its vivid colours in life," and he succeeds in doing so—indeed, some readers may find the colours too bright and the smells too strong. The author's style is vigorous and pungent and his book has the directness and informality of oral teaching. More care might with advantage have been taken with the preparation of the text, and the size of objects illustrated might have been indicated where it is not obvious. The author thinks that he has reduced the amount of purely technical detail to a minimum, but even so he has probably included too much. The time available for the study of forensic medicine in the undergraduate curriculum is so short that it would be best to concentrate on general principles and on those aspects of the subject that are of importance in everyday practice.

R. WHITEHEAD.

ADVANCES IN UROLOGY

The 1946 Year Book of Urology. By Oswald S. Lowsley, M.D., F.A.C.S. (Pp. 392; illustrated. $3.75 or 21s.) Chicago: The Year Book Publishers. London: H. K. Lewis and Co. 1947.

This book is by now well known and needs no description. What the publishers call the "urologic practice quiz"—a number of conundrums printed on the wrapper—is still an unusual feature of it. Even a reader with special knowledge of urology will have to admit that many of the questions are so difficult that he is compelled to turn to the page to which he is referred for the correct solution. But quite apart from this novelty in salesmanship the book is a most useful publication, presenting new advances in urology in a clear and easily assimilable manner.

Although the 1946 volume records no dramatic advances there have been many improvements in surgical technique and in methods of diagnosis. In Britain and elsewhere genito-urinary surgeons are giving more and more attention to the investigation of male fertility and to the treatment of sterility or subfertility when this is found. We must confess, nevertheless, that the treatment of male infertility still remains disappointing. In an excellent article on this subject Norvell Belt records that at present there is only a 46% chance of bringing about improvement. An analysis of the 327 patients unsuccessfully treated showed that a large number of them gave a history of having previously suffered from some protracted febrile disease such as malaria. Harry Benjamin, in a contribution on the same subject, discusses more particularly those cases in which the sexual incapacity of the husband is an obstacle to his wife's conceiving. He found that one-third to one-half of such cases could be improved by testosterone therapy. As large amounts of this hormone may suppress pituitary function and thus aggravate sexual inadequacy, he does not consider it advisable to give more than 10 mg. of testosterone propionate two or three times a week. Transurethral operations on the prostate increase in popularity, and there is an article on prostatic resection in cases of advanced renal insufficiency. From a study of fifty-four patients suffering from this complication and treated at a clinic G. J. Thompson concludes that transurethral prostatic resection in patients with advanced renal insufficiency is justified by the improvement in renal function that follows. In this series one death occurred from coronary occlusion and only two as the direct result of uraemia. The book maintains its high standard and should be of great service to all genito-urinary surgeons.

KENNETH WALKER.

APPENDIX AND URINARY TRACT

Appendicite et Urologie. Etude Médico-Chirurgicale Clinique et Thérapeutique. By L. Strominger. Preface by M. le Professeur Lepoutre. (Pp. 168. 240 francs.) Paris: Masson and Cie. 1946.

The author's intention is to show how frequently the symptoms of appendicitis and diseases of the urinary tract are confused with one another and how they may be differentiated, and he tries to present his case in such a manner that it may interest both the general surgeon and the urologist. The book is in two parts—the first on the appendix and appendicitis, the second and larger part on the urinary tract and the differential diagnosis of the diseases of that tract from appendicitis.

He concisely describes the development, anatomy, and physiology of the appendix and then gives an account of the symptoms of acute and chronic appendicitis, the complications, diagnosis, and treatment. In the second part he emphasizes the intimate relations of the appendix with the organs of the urinary tract and the importance of the intercommunication of the nerve supplies of the intestine and the urinary tract, whereby a painful stimulus in the renal pelvis or ureter may cause spasm or paralysis of the gut. His account of the radiological findings in appendicitis and in diseases of the urinary tract, which simulate each other, is interesting. Finally he discusses in detail those problems of differential diagnosis which 38 years of urological practice have proved to be the most common. The author accomplishes his object admirably and has written a book which is instructive and easy to read.

J. E. SEMPLE.

BOOKS RECEIVED

[*Review is not precluded by notice here of books recently received*]

Treatment by Ion Transfer. By D. Abramowitsch, M.D., and B. Neoussikine, M.D. (Pp. 186. 30s.) London: Staples Press. 1947.

Discusses treatment by ion transfer in a wide variety of disorders; with bibliography.

Hobday's Surgical Diseases of the Dog and Cat. Edited by James McCunn, M.R.C.V.S., M.R.C.S., L.R.C.P. 5th ed. (Pp. 422. 21s.) London: Baillière, Tindall and Cox. 1947.

Includes new material on nursing small animals.

Dying, Apparent-Death and Resuscitation. By S. Jellinek, M.D. (Pp. 263. 10s. 6d.) London: Baillière, Tindall and Cox. 1947.

Intended as a textbook for medical students and practitioners.

Supplement to Lewis's Library Catalogue, 1944–1946. (Pp. 176. 5s.; to subscribers to the library, 2s. 6d.) London: Lewis's Library. 1947.

L'Infiltration Stellaire. By G. Arnulf. (Pp. 234. 400 francs.) Paris: Masson et Cie. 1947.

A monograph on infiltration of the inferior cervical sympathetic ganglion with analgesics.

The Essentials of Obstetrics and Gynecology. By W. A. Scott, F.R.C.S.(Can.), F.R.C.O.G.(Eng.), and H. B. Van Wyck, F.R.C.S. (Can.), F.R.C.O.G.(Eng.). (Pp. 390. 27s. 6d.) London: Henry Kimpton. 1946.

An introductory manual for medical students and practitioners.

A History of the American Medical Association. By Morris Fishbein, M.D. (Pp. 1,226. 50s.) London: W. B. Saunders Co. 1947.

Records the history of the first hundred years of the A.M.A., and includes biographies of its presidents by Walter L. Bierring.

Aging Successfully. By George Lawton. (Pp. 266. 15s.) New York: Columbia University Press. 1946.

Discusses how the ageing can retain their mental flexibility and continue to enjoy life.

Rhinoplasty and Restoration of Facial Contour. By J. W. Maliniac, M.D. (Pp. 327. $7.50.) Philadelphia: F. A. Davis Company. 1947.

Includes sections of skin grafting, fractures, anaesthesia, and the use of photographs.

Light, Vision and Seeing. By Matthew Luckiesh, D.Sc., D.E. (Pp. 224. 12s. 6d.) London: William Heinemann. 1947.

A general account of vision and light and their importance in industry.

Mankind So Far. By William Howells. (Pp. 319. 16s.) London: Sigma Books. 1947.

The story of the evolution of man from mammals.

Die Immunitätsforschung. Vol. I. "Antikörper" Part I. By R. Doerr. (Pp. 259. 24 Swiss francs.) Vol. II. "Das Komplement." By R. Doerr. (Pp. 74. 7.50 Swiss francs.) Vienna: Springer Verlag. 1947.

Investigations into antibodies and complement.

The Case of Rudolf Hess. Edited by J. R. Rees, M.D., F.R.C.P. (Pp. 224. 12s. 6d.) London: William Heinemann. 1947.

An account of Rudolf Hess by the physicians who were in charge of him from 1941 to 1946.

New Ways of Treating Uraemia. By W. J. Kolff, M.D. (Pp. 112. 10s. 6d.) London: J. and A. Churchill. 1947.

Discusses the artificial kidney, peritoneal lavage, and intestinal lavage.

Magic and Healing. By C. J. S. Thompson, M.B.E., Ph.D. (Pp. 176. 15s.) London: Rider and Co. 1946.

An account of magic in medicine throughout the ages.

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THE MANAGEMENT OF POLIOMYELITIS

The worst epidemic of poliomyelitis yet encountered in Great Britain is occurring this summer. Medical men are being asked, "What can I do to prevent myself, my children, and others becoming infected? What is the best treatment and what is the outlook when infection does occur?" Some of the answers to these questions were provided by Dr. Howlett Kelleher in last week's *Journal*. Others are given elsewhere in this week's issue by Prof. H. J. Seddon, whose experience of poliomyelitis in its acute stage must be unique, certainly among British surgeons. It may be helpful to consider some of these modern views on the disease in its two main phases—i.e., before and after the onset of paralysis.

In the pre-paralytic phase it must be admitted at once that nothing can yet be done to prevent paralysis. This is not by any means to say that everyone infected with the virus of poliomyelitis develops paralysis. As Seddon says, it is probably true that at least one-third of all cases fail to develop paralysis or have a paresis so transient as to be of no consequence. And according to reliable American observations as many as 50% of cases recover completely. (The description of poliomyelitis as infantile "paralysis" is therefore misleading.) Bearing this in mind, there seems little or no argument in favour of admitting suspected cases in the pre-paralytic stage to an orthopaedic hospital, the demands on which are already numerous and the facilities of which are to-day seriously curtailed by shortage of nurses. It would appear sounder policy to make use of the fever or isolation hospitals, the staffs of which are specially trained in the management of infectious diseases. If the patient is kept at home the smallest number of people compatible with adequate attention should be allowed in contact; attendants should wear masks and gowns on entering the room, wash their hands thoroughly on leaving, arrange for isolation of the patient's eating utensils, and see that his excreta are destroyed. Even though direct infection from a patient is seemingly rare, these precautions are generally considered advisable.

If paralyses develop orthopaedic facilities become necessary. They can be obtained most effectively by transferring the patient to a hospital, and especially to a country orthopaedic hospital. Seddon has underlined some of the difficulties associated with putting this plan into action, but these should be overcome, for the advantages to the patient of being able to remain in the competent care of the same team for what may prove to be a long and tedious convalescence are enormous. It is lamentable that this segregation of paralysis patients, with all its economy in attendant personnel and with all its other advantages, is being frustrated in many places not so much by shortage of beds as by lack of nurses.

In the paralytic phase three stages, each of somewhat arbitrary duration, can be recognized—the acute, the stage of recovery, and the chronic stage. These are convenient sub-divisions because they are related to treatment. In the acute stage the extent and degree of paralysis are determined and recorded according to a simple plan. The emphasis of treatment in this stage is on rest, just as in the acute stage of any other febrile illness. Joints are supported by simple devices which do not allow deformities to develop either because of gravity or because of the deforming action of unparalysed muscles. Heat is the only physiotherapeutic aid of value at this stage; it relieves muscle tenderness and spasm and is best employed in its simplest form—the hot pack or the hot bath. This early stage of paralysis lasts only a few weeks. None the less, it is important that adequate but simple splinting should be begun without delay, because deformities due to over-action of unparalysed muscles may develop rapidly and if neglected be difficult to overcome subsequently. When muscle tenderness disappears, which is usually within a few weeks of the onset of paralysis, a more active regime of treatment is started. This is the stage of recovery. During it a careful balance must be held between splinting to prevent deformity and overstretching of paralysed or recovering muscles and between controlled activity and the preservation of joint movement. Throughout the history of poliomyelitis undue emphasis has been laid at times on one or other of these apparently conflicting objectives. Some find it difficult to understand how a muscle can be overstretched when the joint which it activates is still capable only of an excursion to which the muscle has always been accustomed. It is, of course, the *prolonged* maintenance of a joint in one of its extremes of movement which results in overstretching a paralysed muscle. The passive movement of a joint through its full range two or three times a day does not produce a harmful stretching effect. On the contrary it is beneficial, because free joint movement is maintained and contracture of unparalysed muscles prevented. Its advocacy by Miss Kenny and others is a notable advance on the times when the principle of "rest enforced, uninterrupted, and prolonged," rightly advocated by a great pioneer of orthopaedics for the treatment of acute inflammatory condition of joints, was misapplied in the therapeutics of paralysed muscles. Thus we have moved to the sensible view that *uninterrupted immobilization*, whether in a so-called neutral position (by surgeons) or in a deformed position (by neglect or ignorance), is wrong.

It is clear then that joint movement can be preserved. But joint movement is of limited value if it cannot be reproduced actively by the patient. At once we are faced with the question, Can anything be done to restore muscle power, apart from preventing undue stretching while the muscles are paralysed? If the anterior horn cells are totally destroyed, clearly the muscles supplied by those cells cannot recover. It takes at least six months, however, before it can be said with certainty that paralysis is permanent. Consequently every helpful form of physiotherapy should be employed during the stage of recovery. What measures are useful in maintaining the nutrition of the life

less muscle? On this topic there are wide differences of opinion. All are agreed that for the partially paralysed or recovering muscle the best treatment of all is controlled activity—gradually increasing the active muscle effort but without producing fatigue. All sorts of devices to lessen the load for the weakly muscles are employed—e.g., exercises in the bath to counteract gravity. Carefully graduated exercise and the proper application of splints are the chief measures of the physiotherapist working under orthopaedic supervision. With strict adherence to scientific accuracy Seddon argues, and no doubt rightly, that there is no basis for using electrotherapy. Yet it is difficult to believe that electrotherapy administered by an expert is of no help in maintaining the nutrition of the completely paralysed muscle and in "giving a boost" to the recovering muscle.

How long does the stage of recovery last? It is probably true to say that no new recovery of any moment in partially or completely paralysed muscle begins after a lapse of six months from the onset of the paralysis. It is important to appreciate that this does not mean that the patient remains for ever as disabled as he may be at the end of six months. During the following eighteen months every effort must be made to build up the strength of the muscles which have recovered and to re-educate the patient in the use of the total muscle power left to him. The extent to which the paralysed individual, and especially the young, can readapt is a never-ending source of amazement. Many will require the help of surgical appliances during this period of re-education. Two years after the onset of disease the patient enters on the chronic stage—more aptly and less pessimistically called the stage of reconstruction. From now onwards the orthopaedic surgeon can supply further help if it is required. The procedures available cover the whole range of reconstructive surgery of the locomotor system—tendon-lengthening and transplantations, bone and joint operations, and the like.

"No one has ever cured a case of poliomyelitis." In these words Seddon expresses a chastening truth. It will be salutary if it stimulates the urge to learn more about this disease, which remains a most serious challenge to the clinician, the laboratory worker, and the administrator alike. Many must feel disappointed that the memorial to be erected to one of the most illustrious victims of poliomyelitis will not be in the form of an endowment for research into acute anterior poliomyelitis.

OURSELVES AND THE RUSSIANS

An article attacking the *British Medical Journal* appeared in the Russian medical newspaper *Meditsinsky Rabotnik* (Medical Worker) for July 3, 1947. It is written by someone who signs himself O. Radbil, and entitled "The Sham Political Neutrality of the *British Medical Journal*." The article is so naïvely absurd that it would be hardly worth taking notice of were it not for the fact that it appears in the official organ of the Ministry of Health of the Soviet Union and of the Ministry of Medical Industry. We may therefore assume that the article does not merely provide an outlet for the spleen of a man who for some reason or other dislikes the *B.M.J.* but represents the official view of the Soviet Ministry of Health. We may even make a shrewd guess that the inquiring and ill-informed Mr. Radbil was told what to write and like an obedient servant of his State wrote what he did. The *B.M.J.* is accused of a "tendency to preserve silence on and ignore the achievements of Soviet medical science (and likewise that of the other democratic countries of Eastern Europe) and to publish mendacious information." Mr. Radbil, in reading the *B.M.J.*, finds it difficult to decide whether some of what he reads is "malicious slander or limitless ignorance." "Such is the journal," he writes, "which does not hesitate to slander the Soviet Union."

What, we may ask, has upset Mr. Radbil—and presumably the Soviet Ministry of Health? The first item of offence is the leading article in the *Journal* of Mar. 30, 1946, on the Health Service Bill (as it then was), and objection is taken to the statement that medicine should "keep itself clear from the influence of prevailing ideologies founded on less exact knowledge." Further objection is taken to a leading article on "Principle and Unity" which appeared in the *Journal* of Feb. 2, 1946, and to this passage in it: "Nothing can do greater disservice to the real interests of medicine than the use of emotive words and phrases, and indulgence in the language of the hustings. To bandy words like 'Fascist' and 'Communist,' 'reactionary' and 'revolutionary,' or to indulge in vituperation against persons, institutions, or parties, will belie our claim, and our just claim, to be considered as a learned and liberal profession whose thought and way of life are based upon science and the humanities." We regret that these suggestions have apparently been without effect on Mr. Radbil himself. In the same leading article we stated: "But probably the mass of doctors are non-political in attitude and want only to get on with their work in their own way with the least possible interference from anyone else." Mr. Radbil considers that this observation has the effect of "elevating political neutrality to a principle." He accuses us of "putting a sign of equality between Fascists and Communists" when in fact we did no such thing. Then he goes on to write: "In the last year and a half there has not appeared in the journal a single article devoted to Soviet medical science, despite the well-known fact that it has won world recognition." A year and a half back from the date of Mr. Radbil's article takes us to February, 1946. If Mr. Radbil had carried his researches into the *British Medical Journal* a little further he would have found that during 1945 we published the following articles on various aspects of Russian medicine:

"The Medical Corps in Red Army Operations, Its Tasks and their Fulfilment," by Prof Yefim Smirnov (Feb. 10, 1945); "Treatment of Gunshot Fractures of the Extremities in Evacuation Hospitals of the U.S.S.R.," by Prof. Nikolai N. Priorov (Feb. 10, 1945); "Amputation of the Extremities, and Prosthesis, in the U.S.S.R.," by Prof. Nikolai N. Priorov (Feb. 10, 1945); "Osteoplastic Re-amputation of the Thigh," by Dr. Alexander Kotov (Feb. 10, 1945); "Some New Developments in the Morphophysiology of the Cerebral Cortex," by Prof. S. Sarkisov, M.D. (July 14, 1945); "Leningrad Surgeons," by Prof. Nikolai Blinov (July 21, 1945); "Medical Science in

Russia"—an account of a session of the Academy of Medical Sciences, U.S.S.R., sent by Academician V. Parin (Dec. 8, 1945).

It will be noticed that in the *Journal* of Feb. 10, 1945, out of seven original articles we published no fewer than four by Soviet medical men. So that Mr. Radbil may be more fully documented when he next refers to the "malicious" tendency of the *B.M.J.* we list the other articles on Russian medicine published since 1938:

"Medical Advances in Soviet Russia" (Dec. 24, 1938).

"Some Contributions to War Surgery from the U.S.S.R." By Ruscoe Clarke, M.B., F.R.C.S. (Sept. 13, 1941).

"Blood Transfusion in the U.S.S.R." By Prof. A. Bagdasarov, Director of the Central Blood Transfusion Institute, Moscow (Oct. 17, 1942).

"Work of the Medical Corps in the U.S.S.R." By a Soviet Doctor (Dec. 19, 1942).

"Surgeons and Surgery in Leningrad," by Prof. N. Blinoff, Leningrad Postgraduate Institute and Blood Transfusion Institute (Jan. 30, 1943).

"Gas Infection of the Brain as One Form of the Serious Complications of Cerebro-cranial Injuries." Report by a Committee of Soviet Scientists (June 26, 1943).

"British Surgeons' Visit to U.S.S.R. Impressions of Soviet Medical Organization" (Aug. 14, 1943).

"Antireticular Cytotoxic Serum." By Alexander Bogomoletz, Member of the Academy of Sciences of the U.S.S.R. (Aug. 14, 1943).

"Russian Surgeons and Russian Surgery." By R. Watson-Jones, F.R.C.S. (Aug. 28, 1943).

"Treatment of Gunshot Fractures of the Limbs." By Prof. Sergei S. Yudin, F.R.C.S.(Hon.), Surgeon to the Sklifassovski Hospital for Traumatic Diseases, Moscow (Nov. 6, 1943).

"Employment of the Tuberculous in Industry in the U.S.S.R." From a special correspondent (Nov. 20, 1943).

"Results of External Prophylactic Version." By M. V. Trubkowitch, M.D., Second Obstetric-Gynaecological Clinic of the Second Moscow Medical Institute, and Prof. B. A. Archangelsky, M.D., Director of the Clinic (Feb. 12, 1944).

In fact, between 1938 and December, 1945, at a time of severe paper shortage, we gave more space to articles by Russian doctors than to those written by doctors of any other country. In addition we have for some years now made repeated requests for an article, or articles, on the organization of Russian medicine, but these requests have been ignored.

Mr. Radbil, doing his best to prove his case, then turns his attention to *Abstracts of World Medicine* and *Abstracts of World Surgery, Obstetrics and Gynaecology*, the first issues of which were published by the B.M.A. in January of this year. "Maybe," he writes, "room is found for the works of Soviet scientists in the special abstracting publications of the British Medical Association?" At the time of his search he found only one abstract from Russian periodicals in the March issues of each journal. And this is why. We have had the greatest difficulty in obtaining Russian medical periodicals. In August, 1946, we wrote to the State Central Medical Library, Moscow, informing them of the proposed publication of the abstracting journals and saying that we were most anxious to include in them abstracts of Russian medical literature. In exchange for Russian medical journals we offered the *British Medical Journal* and the nine quarterly journals published by the B.M.A. We received from the State Central Medical Library *a list* of twenty-four journals, with an assurance that we should receive them in exchange for our publications. But the Russian medical journals never arrived. We tried again to obtain these journals by appealing to U.S.S.R. medical representatives in London, but again failed to obtain what we asked for. Finally, while continuing for a time to send our journals to Moscow, we subscribed through a London agency and are now receiving in the abstracting service 11 of the 24 U.S.S.R. medical periodicals considered by the State Central Medical Library to represent the best of Russian medicine. It should be added that, of these, *three* are now being obtained by exchange with our own periodicals. In addition, three other journals are being received in exchange.

So that the last burden of his complaint may be known to British readers we refer to his indignation at the "impartial, cold selection of 'cases'" in the articles by P. L. Mollison entitled "Observations on Cases of Starvation at Belsen" (Jan. 5, 1946), and by W. R. F. Collis and P. C. MacClancy entitled "Some Paediatric Problems presented at Belsen Camp—A Clinical Survey" (Feb. 23, 1946). He is also very cross with Dr. Lydia Fehily because of her observations in the article entitled "What the Russians Eat," published in the *Journal* of May 18, 1946, and particularly with her remark that "the peasant feels himself secure from hunger so long as he has a cow." In these days when fact and fiction are so inextricably mixed in the unholy name of propaganda we think it right to place the above facts on record, and can assure Mr. Radbil, and through him the U.S.S.R. Ministry of Health, that in the limited space still at the disposal of the *British Medical Journal* we have a sincere desire to inform British readers of the advances and contributions of Russian medicine.

BRITISH ASSOCIATION

With the Edinburgh Music Festival and the Meeting of the British Association at Dundee, Scotland reminds the rest of the world of its traditional love of learning and the Arts. The British Association opened its eight-day proceedings on Wednesday of this week with the Presidential Address on "Science in War and Peace" by Sir Henry Dale, in which he once more showed his great gift as an expositor of a general theme. He illustrated by many examples how war had acted as an accelerator of discovery. "How many decades of research," he asked, "do you suppose, undertaken in response to no stimulus stronger than the desire to add to the resources of peace, would have been required for those developments of radiolocation and radar which were achieved in a few years under the imminent threat and the realized peril of war?" He touched, too, upon the contributions of physiology and experimental psychology to the adaptation of man to the machine, observing that "war has thus enforced a lesson which surely should not be forgotten in peace, that machinery was made for man and not man for machinery." Much of what was discovered during the war had obvious peacetime applications. An exception to the obvious which Sir Henry mentioned was di-isopropylfluoro-phosphonate—D.F.P.—the subject of an annotation in the *Journal* of July 19. This substance was one of a series of substances developed as poisons to be used if necessary in chemical warfare. The power of D.F.P. in annulling the action of cholinesterase has been used medically in combating ileus and in reducing intra-ocular tension in glaucoma.

Sir Henry devoted much of his address to the attitude of scientists to research work and the effect of the war

upon this. During six years or more the majority of scientists in this country had had to devote the greater part of their thoughts and energy to seeking rapid solutions for practical problems. "Does anyone doubt," Sir Henry said, "that, to enable science now to render its best service to mankind, we need to take a long-range view and to give our first care to the extension of fundamental knowledge, unconstrained by aim at any practical objective?" He feared that scientists might find it difficult to shake off "the spendthrift habit in research, the policy of trading for quick returns." He hoped that men with the rare creative ability needed by science would not readily be persuaded that "their best service to science can still be rendered by planning and organizing, or by bringing scientific ideas to bear upon policy." He urged "a resolute watchfulness against any encroachment, on activities proper to peace, of a secrecy which we accepted as an abnormal condition in war." Science sought a progressive revelation of the truth of material nature, and in fulfilling its mission for freedom could make its own contribution to the cultural and moral equipment of mankind. Sir Henry ended a memorable address by stating his belief that there might yet be need to be on guard "lest some new and extraneous philosophy or political system, invoking, perhaps, the authority of Science to bolster its pretensions, may seek again to limit and to compromise, with a new orthodoxy, the freedom of Science to seek and to proclaim such truth as it can discover. . . ."

UGANDA JUBILEE

"In 1893 Mr. Gladstone's Cabinet had decided to evacuate Uganda, when his Scottish agent informed him that if he did so he would certainly find that he had to evacuate Downing Street also. Uganda was not evacuated." Thus Lord Elton[1] sums up the effect of popular opinion in compelling a reluctant Government to consolidate the notable achievements of Capt. F. D. Lugard in East Africa. Capt. Lugard had entered Mengo, then the capital of Buganda, on Dec. 18, 1890, with a force of 50 Sudanese soldiers.[2] Dr. Albert R. Cook entered Mengo on Feb. 19, 1897, with a small party which included a nursing sister, Miss Katharine Timpson. On May 14 they opened the first hospital which East Africa had ever known. Elsewhere in this issue (p. 342) Dr. R. T. S. Goodchild, the present medical superintendent of Mengo Hospital, describes how two grass-thatched huts with reed walls and mud floors grew in fifty years into a modern hospital and training school for midwives.

The same story has been told in detail by Sir Albert Cook himself in his *Uganda Memories*.[3] In a foreword Lord Lugard, five years after he had left it, describes the doctor who entered Mengo as "one of the first and greatest pioneers of medical work" in Africa, and says that "he was privileged to live and work during the forty years when British policy in East Africa was in the making, and these *Memories* show how great his contribution was to the results in Uganda." Lord Lugard also pays tribute to the work of the late Lady Cook, formerly Miss Timpson, who was matron of the main hospital for 21 years, and the founder of the Maternity Training School. In 1923 she and her husband published an illustrated handbook of midwifery, *Amagezi Agokuzalisa*, for the use of the native students in the Uganda Protectorate.

The Uganda Branch of the B.M.A. had its inaugural meeting on Dec. 23, 1913, and elected Dr. Cook the first president. His brother, Dr. Jack Cook, and his nephew, Dr. Ernest Cook, were among the ten founder members. Sir Albert was knighted in 1932 and was president of the Uganda Branch for the third time in 1936. To mark his jubilee and that of the start of regular medical work in Uganda the Branch has arranged at Kampala a three-day interterritorial meeting which begins next week. There will be a reception in honour of Sir Albert Cook, and an appeal is being made for funds to continue the work which he and Lady Cook began fifty years ago. A programme of rebuilding is being undertaken at an estimated cost of £30,000.[4] Donations should be sent to the Secretary of the Jubilee Appeal, Box 161, Kampala, Uganda.

[1] *Imperial Commonwealth*, 1945, p. 370, Collins, London.
[2] *Encyclopaedia Britannica*, 1929, **22**, 665.
[3] *Uganda Memories* (1897–1940), 1945, The Uganda Society, Kampala.

TREATMENT OF BASAL-CELL EPITHELIOMA

Basal-cell epithelioma, still more familiar under its old name of rodent ulcer, is well known as a "locally malignant" tumour which invades slowly and does not metastasize. Unless, through neglect, the local invasion is unusually serious, the results of treatment are good. Paterson, Tod, and Russell[5] irradiated a series of about 1,000 cases at the Holt Radium Institute, Manchester, during the period 1934–8 and recorded 5-year survival rates of 99% for minor growths and 86% for major growths. Most of the patients who died with tumour still present were killed by intercurrent disease, not by the tumour. Amersbach, Walter, and Sperti[6] used a small series of rodent ulcers to test the action on malignant tumours of extracts of human liver and spleen. They injected the extracts repeatedly in and around small tumours in 21 patients. One patient failed to respond to treatment, 6 were still under treatment but the tumours had diminished, and 14 patients had continued treatment until the tumour had completely regressed. No recurrences had been observed during one to two years' observation after treatment. Paterson and his colleagues remark that the usual progress is so slow that even 5-year survival rates are of little value. They describe rodent ulcer as comparatively trivial and easily treated, but add warnings that if the opportunity to cure by correct treatment is missed when the tumour is first recognized much greater difficulty may be encountered later and inappropriate treatment may encourage extension. Their conclusion, based on wide experience, that rodent ulcer should always be taken seriously and treated fully will be generally endorsed.

The use of rodent ulcers for "screening" tests of cancer treatments entails a possible risk to the patient with little probable gain to the investigator. Amersbach, Walter, and Sperti base their treatment on numerous reports of beneficial effects of extracts of liver and spleen on transplanted tumours of animals. Most of these experiments ignore the limitations of transplanted tumours, and no experienced laboratory worker would accept the evidence as convincing or relevant to the treatment of human cancer. Amersbach and his colleagues chose these localized, easily accessible tumours of low malignancy to make sure that any beneficial action of the extracts could be readily observed. These favourable circumstances for observing an effect unfortunately reduce the probability that the effect would be reproducible on less amenable cancers. Finally, tests which involve direct infiltration of the tumour and its surroundings by the supposed therapeutic agent are of little value. It is not particularly difficult to destroy a superficial lesion by chemical or physical agents, but local destruction is not synonymous with cure. Further reports on this treatment may be awaited without enthusiasm.

[4] *British Medical Journal*, 1947, **1**, 424.
[5] *The Results of Radium and X-ray Therapy in Malignant Disease.* Being the Second Statistical Report from the Holt Radium Institute, Manchester. E. and S. Livingstone, Edinburgh, 1946.
[6] *Arch. Derm. Syph.*, 1946, **54**, 119.

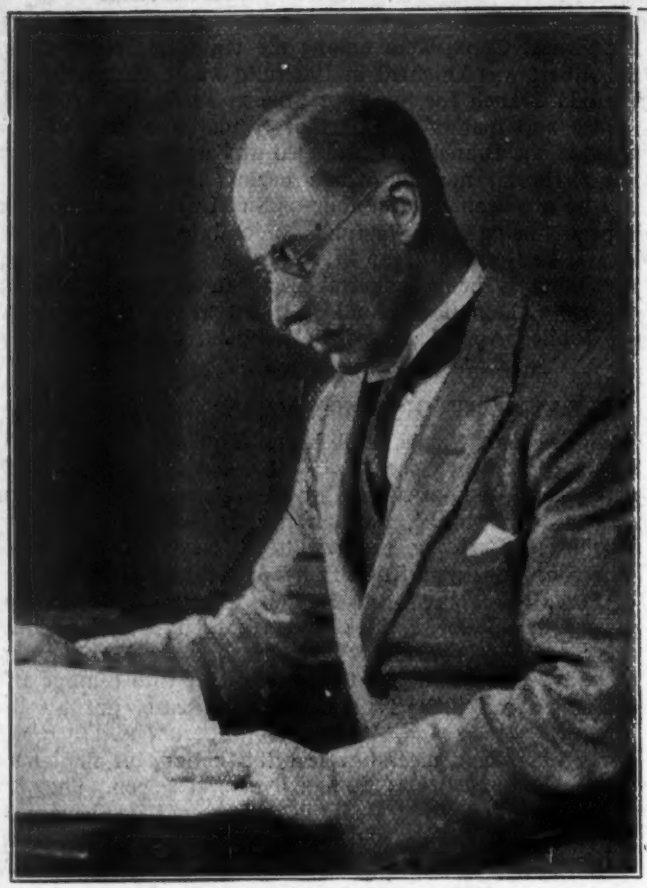


FIG. 1.—Sir Albert Cook, *circa* 1937.

A MEDICAL JUBILEE IN CENTRAL AFRICA

BY

R. T. S. GOODCHILD, M.B., B.S.Lond., F.R.C.S.Ed. D.T.M.&H.

Medical Superintendent, C.M.S. Mengo Hospital, Uganda, East Africa

Medical men have always been prominent in pioneering expeditions, and the early story of East Africa is no exception to the rule. Livingstone's journeys never brought him as far north as Uganda, but his contemporary Stanley made more than one visit. He was much impressed with the country and the people, and in 1875 sent a dispatch to the *Daily Telegraph* describing them and appealing to Christian missions to send out pioneers to open up the country; he stressed the importance of sending a medical man by saying, "But oh, that some practical missionary would come here. . . . It is not a mere preacher that is wanted . . . it is the practical Christian tutor, who can teach people how to become Christians, cure their diseases." The response to this appeal came shortly afterwards from the Church Missionary Society, which included among the first party not only a practical engineer, Alexander Mackay, but also a doctor, John Smith. The story of these early pioneers is a matter of history. Unfortunately, the doctor never survived to reach Uganda, and although one or two other medical men followed they either failed to reach the country or were invalided home after a short stay.

It was not until 1897 that the "practical man who could cure diseases" finally started the systematic practice of medicine in Uganda; and this year Sir Albert Cook, C.M.G., O.B.E., M.D., celebrates the jubilee of his arrival in the country. The work which he established was not the first medical work, as military garrisons had medical officers, but his was the earliest attempt at treatment of natives in that part of Africa. The hospital which he opened—Mengo Hospital—celebrates this year also the jubilee of its foundation.

The First Hospital

Sir Albert describes his early experiences graphically in his recently published autobiography, *Uganda Memories*. He arrived at the east coast port, Mombasa, in September, 1896, with a party of missionaries, including the first nursing sister to be sent out—Miss Katharine Timpson. She became the matron of Mengo Hospital and later married Dr. Cook, and for many years was his very able assistant in the work. There was no way into the interior in those days other than on foot, and the preparations for the three-months journey took a great deal of time at the coast before the "safari" started out. Hundreds of porters had to be collected and all the baggage divided into suitable loads for head carriage. Food for the journey for such a large number, travelling for long periods over barren waterless wastes, was a major problem, and it was some time before a start could be made. Dr. Cook began his medical work on the journey, and his memoirs tell of many interesting experiences.

At last, in February, 1897, the party arrived at Mengo, the capital of the native ruler of Uganda. They were greeted by the small European community, consisting of a handful of Government officials and a few missionaries. The doctor wasted no time in getting down to work, and in a few days he was already conducting a clinic and treating numerous African patients. It is interesting to read that at first the missionary authorities were doubtful of the wisdom of starting medical work and wished to send Dr. Cook up-country to pioneer. Ultimately wiser counsels prevailed, and the first hospital in the interior of East Africa was opened at Mengo in May, 1897. Conditions were exceedingly primitive in those early days. The buildings were constructed of reeds with a grass thatch, but patients were admitted and lay on locally made wooden beds. Operations were performed in a separate small reed hut. The cost of drugs and equipment was fantastically high, and the difficulties of obtaining supplies, which had to be brought up by head-porterage for a three-months journey from the coast, can only be imagined to-day. A four-gallon tin of paraffin oil cost £4, and often arrived half empty, as the porters did not take long to discover that a small hole punctured in the case helped to lighten the load considerably as the days wore on. We read that this difficulty was overcome by packing bars of soap round the tin of oil in the case. Epsom salts cost three shillings a pound.

But Dr. Cook has always believed in doing thoroughly whatever he did, and the work was founded on a firm basis. In the library of the hospital to-day there are shelves containing bound copies of the *British Medical Journal* from the early years of the century and the *Medical Annual* from the year of the doctor's arrival. Another feature is the rows of neatly bound volumes of case sheets with detailed histories and treatment of every patient admitted from the start. The first sheet gives an account of a patient treated on the journey up—a European who died of osteomyelitis of the iliac bone following a gunshot wound. The care taken with these records is clearly shown in one of the earlier volumes, where many of the temperature charts are ruled by hand, as a consignment of charts had failed to arrive from home.

The Present Building

Two years after his arrival Dr. Albert Cook was joined by his brother, Dr. Jack Cook. The former had completed his medical course at St. Bartholomew's Hospital, but his brother came from University College Hospital, and, with his qualifications of M.S., F.R.C.S., might have had a brilliant career in London if he had not decided to devote his surgical skill to missionary work in the heart of Africa. The partnership of the two brothers has become classical in the annals of medical missions, and their reputation reached over wide areas of Africa.

The first hospital was soon replaced by a much more ambitious building in mud and wattle. Unfortunately this was struck by lightning and burned to the ground soon after it was completed. Hundreds of pounds' worth of surgical instruments and equipment were lost. It is amusing to read of the fate of recently arrived glass-fronted instrument cupboards. Over-enthusiastic helpers, with no conception of the nature of glass, hurled these cupboards out of the burning operating theatre and the roar of the flames was augmented by the crash of breaking glass. The present main hospital block was constructed in its place and, although built only of sun-dried bricks, this building has now stood up to the rigours of

tropical climate for over forty years. Other structures were erected from time to time, but in the main all the buildings are over twenty-five years old.

The practice of medicine and surgery was carried out on virgin soil, and opportunities for original work were numerous. Epidemics of appalling severity constantly swept the country. Smallpox was one of the earlier problems met with. Dr. Jack Cook had brought out with him one small tube of lymph, and with this four or five youths were vaccinated. Unfortunately, the "follow-up" department is one of the last features of an African hospital to be successful and all the boys disappeared. By a coincidence, a few days later the doctor's wife saw in the native market one of the lads with the unmistakable scab of a successful vaccination on his arm. He was brought back to the hospital and a few precious drops of lymph obtained and other direct vaccinations performed. Before long the obvious immunity conferred brought other natives along, and soon hundreds were being vaccinated daily. In the early years of the century another deadly and mysterious malady made its appearance and a great number of natives died. Dr. Jack Cook had read an article with a description of the recently recognized disease trypanosomiasis. He soon realized that they were dealing with an outbreak of what was subsequently to prove such an appalling scourge to Uganda. Reports which he sent home led to the sending out of the Commission which did such yeoman service towards eradicating the disease.

By 1910 the hospital was lit by electricity obtained from a charging plant, and this made it possible at that early date to install the first *x*-ray apparatus. For many years this was the only plant in the country and it proved a very valuable asset.

The hospital had grown until, by the time of the outbreak of the war of 1914–18, it was in a position to become at once the main base hospital for Uganda during the East African campaign. The European staff at that time consisted of five or six doctors and eight sisters, with a dispenser, an electrical engineer, and others. Convoys of sick and wounded began to arrive and the hospital was filled to capacity. Extra wards were quickly erected, and at one time there were as many as 530 patients. The hospital has special blocks for European and Indian patients, so that all comers can be dealt with.

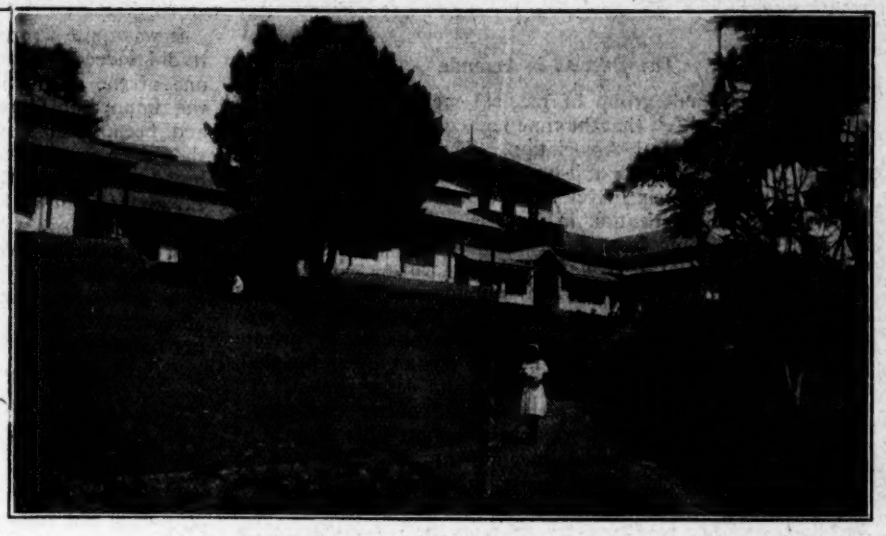


FIG. 3.—Mengo Hospital central block to-day (built 1904).

FIG. 2.—Second Mengo Hospital building, 1900. Destroyed by fire in 1904.

Foundation of Medical School

After the war a medical school was started. Educated young Africans were enrolled and given a three-years course which fitted them to work as senior orderlies or medical assistants. This school was carried on until 1934, when, at the request of the Government, the training of medical students was left to the newly formed medical school attached to the rapidly expanding Government hospital at Mulago, in Kampala. Mengo Hospital's part was the training of nurses and midwives. This work, again, was pioneered by Dr. and Mrs. Cook. The Midwives' Training School was started in 1918, and after a two-years course the girls entered for a Government qualifying examination. The need for African midwives became greater as maternity centres, each with ten or a dozen beds and an antenatal clinic, were rapidly opened up all over Uganda. Each centre was staffed by two or more trained midwives and was visited regularly by European doctors and sisters from Mengo Hospital. Other trained girls also started passing into Government service. This enterprise soon began to have a profound effect on the appalling maternal and infant mortality rates prevalent in Uganda, and much credit is due to the late Lady Cook, by whom the whole scheme was developed. A similar school for nurses was established in 1928 with a three-years course. Many of these girls after qualification proceed to the midwifery course, and become registered by the Uganda Midwives Board as well as holding the nursing diploma. For a number of years now these girls have been drawn from all the East African territories, and have afterwards gone back to work in Government or mission hospitals in Kenya and Tanganyika as well as Uganda, and some into the Belgian Congo. There are to-day about 120 girls in training for one or other of these diplomas.

Space forbids the detailing of more of the enterprises in therapeutic and prophylactic medicine and training initiated at this hospital by the Cook family. Their name became a household word in Uganda and the surrounding territories, and Dr. Cook himself and his wife were repeatedly afforded public recognition of their services to the country. Sir Albert and Lady Cook retired from active work in 1934. Throughout their long career both were inspired by a simple faith; they saw that Uganda could never fully benefit from the health services they initiated without also being given the gospel from which had sprung the same spirit of care for suffering in Europe hundreds of years before.

The B.M.A. in Uganda

In 1913 the small group of medical men in Kampala, the capital of Uganda, felt that the time had come to form a branch of the British Medical Association. The first meeting took place at Dr. Cook's house and he was elected the first president of the Uganda Branch. Ever since that time the B.M.A. has been an active organization in Uganda. A great deal of the inspiration has come from the enthusiasm of the staff of the Government hospital at Mulago with its medical school. The B.M.A. has been instrumental in building up the very close co-operation that exists to-day among all branches of the profession in Uganda, whether Government, mission, or private practice. Regular meetings are held at one or other hospital, when papers are read, lectures given, and cases shown. To mark the jubilee of its first president and of the commencement of regular medical work in the country the Branch is organizing an interterritorial meeting of the East African Branches to be held in Kampala in September this year. A series of meetings will take place over a period of three days, and papers will be read by delegates from the various Branches. A reception is planned in honour of Sir Albert Cook, who still lives in retirement in his lovely house, with its priceless library, overlooking the blue waters of Lake Victoria.

The story of these fifty years comes from a generation that is rapidly passing. There are few if any parts of the world to-day where there remain such opportunities of building up the structure of modern medicine on virgin soil. But so long as the tradition that these pioneers founded is preserved, there need be no fear for the future. It is a tradition which includes the acceptance of nothing shoddy or second-best in medical practice or teaching; attention to detail; constant endeavour to improve on what has already been started; and a determination that only the best in Western medicine and nursing shall be handed on to the indigenous professions being built up. But in addition emphasis must be laid on that essential part of medical mission work—the handing on of the spirit of self-sacrifice so perfectly exemplified in the life of the Good Physician.

THE NUTRITIOUS LOAF

The nutritional value of bread was the subject selected by Sir Jack Drummond for his Sanderson-Wells lecture delivered at the Middlesex Hospital on June 24. He pointed out the close relation of bread to the standard of living. When the standard rose the tendency was for bread and flour consumption to fall and for sugar consumption to increase. During the war the consumption of bread rose by 17%.

The search for a white loaf could be traced far back in history. The people of an earlier period, like many to-day, associated a dark loaf with adulterated or inferior flour. In the middle of the nineteenth century the development of roller milling enabled the millers to mill far more wheat and to produce a much whiter flour. It was not then suspected that the production of the more attractive flour might be at the expense of nutritional value. Later it was suggested that white flour was not as nutritious as it should be, but there was lack of evidence on the point until about the twenties of the present century, when it was demonstrated that certain dietary factors were missing. Had the war not come, with consequent shortage of shipping space, Sir Jack Drummond was convinced that this country would have taken the same course as the United States in reinforcing the flour by various elements considered appropriate.

The question of the use of the wheat berry was one of balanced economy. The optimum point was 82 to 85% extraction; beyond that point digestibility was reduced because of the bran. Colour confused the problem. A compromise was reached with 80% extraction, which assured a loaf of acceptable appearance, texture, and colour, and of a nutritional value which, taking into account the rest of the diet available, should afford adequate nutrition. Medical and scientific opinion was strongly in favour of the retention of the various ingredients in the process of milling.

It was quite wrong to assume that bread was a starchy food. It did indeed contain a good deal of starch, but it was also one of the chief sources of good and cheap protein. Bread was important, along with potatoes, as an energy-giving food, and because of this it was desirable that both these foods should be unrationed. As soon as it was necessary to ration bread or potatoes the nutritional programme was jeopardized. Bread, of course, was now rationed, and the only "buffer" source of energy was potatoes, the supply of which was notoriously unreliable. When there was not a free supply of energy available in the form of these two staple foods the vulnerable groups of heavy energy expenders were liable to suffer, adolescents failed to gain weight, and so forth. This would not be put right until bread rationing could be called off.

IMMUNIZATION AND VACCINATION

L.C.C. PROPOSALS

Proposals on immunization and vaccination have been submitted to the Minister of Health by the London County Council as the local authority for carrying out certain duties under the National Health Service Act. At present diphtheria immunization in London is undertaken by whole-time and part-time medical officers of the metropolitan boroughs, and also by general practitioners at sessional rates at maternity and child welfare centres, and by general practitioners on a fee basis. The Council regards these arrangements as satisfactory for its general plan and proposes to continue and to expand them where necessary.

Special efforts will be made to increase the number of immunizations in areas where at present the proportion of children immunized is below 50%. In only seven metropolitan boroughs are more than 50% of the children under 5 immunized. The state of affairs is more satisfactory with children of between 5 and 15, over 50% of whom have been immunized in 18 out of 29 boroughs (in Kensington the proportion in the middle of 1946 was over 86%). It is hoped to bring the percentage of immunized children in London to 75 or 80%. Parents are to be given the choice of having their children immunized either by a clinic doctor or under the general practitioner scheme. General practitioners are to be encouraged to advise parents of the importance of post-Schick testing, and to arrange, if they carry out the tests themselves, to send a record of the result to the Council, or, if they prefer, to send the child to the Council clinic for test. Special measures are to be taken through health visitors to encourage the acceptance of immunization.

For children of school age the immunization facilities will be available at clinics and child welfare centres and, from the "appointed day," special immunization sessions at day and residential schools. At these sessions the services of whole- or part-time medical officers and of general practitioners on a sessional basis are to be utilized, and parents who so desire may have their children immunized by a general practitioner at his own surgery or at home. Here again there will be arrangements for post-Schick testing after primary immunization (but not for children given reinforcing doses). All medical officers or general practitioners taking part in the immunization arrangements will be required to provide records in a form determined by the Minister, and all general practitioners in the county, whether or not they intend to provide general medical services under the Act, will be invited to participate in the immunization scheme.

Infant vaccination against smallpox will be encouraged to ensure that at least as many children are vaccinated as immunized. Parents will be asked to indicate whether they wish to take their children to a vaccination session at a convenient centre or to have vaccination carried out by the family doctor. Similar arrangements will be made to those outlined for diphtheria immunization concerning the keeping of records and the payment of fees to general practitioners. With regard to whooping-cough, until the value of inoculation has been fully established the question of a comprehensive scheme for the county is to be left in abeyance. Eleven boroughs at present provide for such inoculation. A scheme for inoculation, sub

ject to parental consent, for children under 2 in the Council's residential nurseries has recently been inaugurated. The antigen used is A.P.T. combined with pertussis vaccine of the dosage supplied to the M.R.C., the course consisting of three doses at monthly intervals. It is proposed to continue the existing arrangements and to expand and develop them if the results of further investigations justify that course.

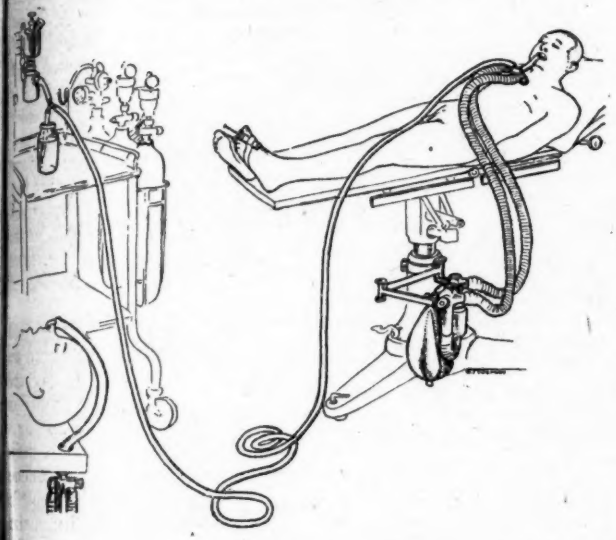
The estimated number of immunizations against diphtheria of children up to 15 for the year ending March 31 next is 57,000, and of vaccinations against smallpox, 36,000. The cost of the immunizations is provisionally estimated at £15,550, and of the vaccinations £7,000. In making the latter estimate it is supposed that general practitioners will perform some 10,000 vaccinations on a fee basis, leaving some 26,000 for clinic sessions.

Preparations and Appliances

REMOTE CONTROL OF CLOSED CIRCUITS IN ANAESTHESIA

Dr. NORMAN R. JAMES, Anaesthetist, Plastic and Jaw Unit, Rooksdown House, Park Prewett Hospital, Basingstoke, writes:

The control of the gases supplied to a closed circuit has often proved difficult under circumstances peculiar to maxillofacial surgery, owing to the proximity of the anaesthetic machine (with its carbon-dioxide absorber) to the field of operation. This interferes with the work of the surgeon and his assistants, and with the maintenance of sterility. A system of remote control which has proved useful has been devised by my colleagues, Dr. Shackleton and Dr. Enderby, and myself. The M.I.E. absorber has been attached to a jointed swivel



rm clamped to the central column of the operating table. he tubing supplying the gas to the endotracheal connexion of e circuit has been lengthened to 20 ft. (6 metres) so that the aesthetic table with its flowmeters can be placed at the her side of the operating theatre, completely out of the way f the operating team.

We have found by experiment that the circuit tubing can be tended only a little without increasing resistance to breathing, t the supply tubing can be extended to any length. An dded safety device is a water manometer standing on the aesthetic control table and connected to the supply tubing y a "Y" piece. This manometer "blows off" with a bubbling und if the supply tubing is obstructed, as by somebody stand- g on it. It also prevents a dangerous accumulation of pressure n the closed circuit should an excess supply of gas be delivered m the flowmeters or by-pass. The manometer's pulsations lso provide an exact guide to the frequency and amplitude of he respirations and, in a lesser degree, to the pulse. In practice the patient is not connected to this remotely controlled carbon-dioxide absorber unit until the endotracheal tube has been passed and the nasopharynx packed off.

Induction is by thiopentone plus cyclopropane and oxygen delivered through an ordinary Magill rebreathing unit with the expiratory valve closed. We find the slight build-up of carbon dioxide in the Magill unit an added advantage in the process of intubation. Once the remotely controlled carbon-dioxide absorber unit is connected the anaesthetic is usually maintained by nitrous oxide and oxygen supplemented by intermittent small doses of thiopentone from a syringe strapped to the patient's foot. This method tends to minimize the capillary oozing so prevalent when cyclopropane and oxygen is used for maintenance.

Another innovation has been the punching of holes in the operating table at selected points near where the patient's head usually lies, so that the tube connecting the patient to the absorber circuit cannot be interfered with by the surgeon and his assistants pressing against the edge of the operating table. Contrary to theory, we have found that a long endotracheal mount works in practice provided the connecting tube is the right bore, with connexions streamlined, and does not contain any of the dangerous constrictions which characterize most of the endotracheal connexions used in this country at the present time. The principle propounded by Thornton (*Journal*, 1945, 2, 534) in the design of his endotracheal connexion should be given more recognition. Finally we have tried not to forget the dictum that "observation of the patient is more important than that of the apparatus" when using this very satisfactory method of remote control.

Nova et Vetera

NATIONAL HEALTH INSURANCE IN THE SEVENTEENTH CENTURY

Dr. Hugh Chamberlen, who was born in London about 1630 and who died in Holland early in the following century, the exact dates being unknown, was a distinguished member of the famous family in which the secret of the first obstetric forceps was carefully guarded for more than 125 years. The medical members of the dynasty included three Peters and two Hughs, the subject of the present note being Hugh senior, grand-nephew of Peter Chamberlen the elder, who invented the forceps. This Hugh was physician to King James II, whose queen he attended at the birth of Prince Charles Edward, later known as the "Old Pretender," but his activities were not limited to medicine. He proposed various schemes for public welfare, including a Land Bank, a plan for the union of the English and Scottish Parliaments, and, most interesting of all to us to-day, a "*Proposal for the better securing of health*," which he submitted for consideration in 1689.

"It is humbly proposed that a more compleat Constitution of Physick may be established, whereby all sick, poor or rich, shall be advised and visited by approved, skilful, Physicians and Surgeons; for all diseases except the Pox, Midwifery, and cutting for the stone, for which three last calamities some additional allowance may be settled; because the Pox may not be hereby encouraged, and Deliveries require mighty pains, and unseasonable hours; and the Stone is not only a particular dexterity but requires much attendance. And all this (except as before excepted) for a small yearly certain sum assessed upon each house . . . which sum will not be the third part of what is now spent in Apothecaries' Bills in a healthy year. . . . Whereas many at present miserably perish for want of timely and skilful assistance.

"And it is further humbly offered that the laws already in being may be revised, which provide against the sale of unwholesome food; that bread may be well baked; beer well brewed; and houses and streets well cleansed from dirt and filth; all these being common causes of diseases and death."

The proposal does not seem to have been considered by the Parliament of that day, but it is interesting to recall the effort of this enlightened reformer, in our own time when similar legislation is under discussion.

D. G.

Correspondence

The Indian Medical Service

SIR,—Enclosed is an advance copy of a letter of retrospect and farewell which I propose posting to all officers of the Indian Medical Service on the eve of its dissolution. I shall be grateful if this can be published in the next issue of your *Journal*:

Office of the Director-General,
Indian Medical Service,
New Delhi.
Aug. 14, 1947.

Our Service dissolves on Aug. 14, 1947, and I send you this letter of retrospect and farewell.

Our history as a Service dates back to 1612, when, on the formation of the East India Company into a joint stock business, John Woodall was appointed the first Surgeon General of the Company. He held this office for nearly thirty years, and for many years was the only Surgeon General of the Company. Until 1763, when the surgeons employed by the East India Company were combined into a regular establishment, with fixed grades for promotion, medical officers were recruited more or less on individual contracts. Though occasionally involved in the desultory fighting which took place from time to time, they were essentially civilians and engaged in purely civil duties. From 1745 onwards, however, the Company's wars in various parts of India necessitated the formation and maintenance of regular bodies of troops, and in consequence the employment of military surgeons. In 1766, therefore, little more than two years after its first formal constitution, the Medical Service in India was divided into two branches—military and civil. It was combined into one Service soon afterwards, but in 1796 was again split up. The separation was once more found impracticable and the two Services were speedily reunited.

The professional activities of our early predecessors in the Service were most varied. They were eligible for practically any post in which scientific knowledge was required. They were regularly employed, for example, in the Assay Department and in botanical gardens, and not infrequently went further afield. Among those extra-professionally employed, a Commission appointed in 1866 noticed a postmaster, a cotton agent, a superintendent of a school of arts, a naturalist, a political agent, a commissioner, and a conservator of forests. Members of the Service played an important part in the organization of both the Forest and the Veterinary Departments.

A professor of chemistry in the Calcutta Medical College conducted the first experiments for the introduction of the electric telegraph in India and became the first Director-General of Telegraphs in 1852. Later a physician-general, Madras, introduced cochineal into India and had a large share in the introduction of silk, sugar-cane, coffee, and American cotton.

With the increasing specialization of Government Departments and the recruitment by them of their own experts, the call on our Service to fill posts outside our strictly professional sphere gradually diminished, the variety of our activities was curtailed, and we concentrated increasingly on our medical work. In 1896 the medical establishments of Bengal, Madras, and Bombay were amalgamated into one Service under the direct control of the Government of India, and the designation "Surgeon-General to the Government of India" was altered to that of "Director-General, Indian Medical Service."

Until the first great war the I.M.S., in spite of its basic military nature, was, in fact, predominantly civil in character. The Royal Commission on the Public Services (1912–15) found that out of 748 officers 475 were engaged in civil duties. Thereafter, though from time to time the monopoly of superior civil appointments enjoyed by the Service was substantially reduced, it retained its dual character, the last reorganization in 1937 fixing the military strength at 364 and the civil at 220. From 1915 the percentage of Indian recruitment steadily increased. In this regard we can claim that we have contributed at least as much as any other branch of the Defence Services to enable this country to shoulder the responsibilities devolving on it under the new Constitution. A feature of the Service's history in these latter years was the creation from its ranks, on the separation of Burma, of a civil medical service for that country.

By 1939 many thoughtful members of the Service had arrived at the conclusion that in order to meet the political and administrative requirements of modern India a fundamental reorganization of the Service was overdue. A suitable reorganization would, they felt, include the creation by the Defence Services of their own medical corps. In 1943 the creation of the Indian Army Medical Corps made the abolition of the I.M.S. in its present form merely a matter of time. The far-reaching constitutional changes of 1947 have made it immediate.

As I pen these words to you, the Service is being wound up and its members are dispersing. Some of us will find new careers in the service of the Crown, in the health services at home, and elsewhere in the British Commonwealth. We know that their service here has fitted them to contribute generously to their new tasks. Our Indian members will be completely absorbed, with some of their British colleagues, in the two new Dominions. To them in their new sphere, and to those who will work with them, we hand on our torch. Its flame has burnt brightly through nearly three centuries of distinguished and devoted service. It is our cherished hope—nay, rather, our firm conviction—that in their hands its light will not fade. Frater, ave atque vale!

—I am, etc.,

R. HAY,
Lieut.-General,
Director-General, I.M.S.

R.A.M.C. War Memorial Fund

SIR,—May I use your correspondence columns to invite the attention of the profession to the Royal Army Medical Corps War Memorial Fund and to the Army Medical Exhibition at Stanley Park, Blackpool, which opened on Aug. 20 and remains open, Saturdays and Sundays included, until Sept. 6.

The Memorial Fund has been formed under the patronage of H.M. the Queen to relieve distress and help in the education of the families of the two thousand officers and men of the R.A.M.C. who were killed, and of the many more who were disabled, in the war. The Exhibition has the double object of recruiting and raising money for the Memorial Fund. It is of some interest to the medical profession as well as the lay public, and includes demonstrations of the evacuation of casualties, water purification, and preventive medicine in the field. A small historical section includes, among other things, Florence Nightingale's coach and famous lamp. The band of the R.A.M.C. will play, and there will be P.T. displays by the boys of the R.A.M.C. Depot.

I would like to enlist the support of the profession, in particular those who have served in the R.A.M.C., for the fund, and will be grateful if those who are willing to do so will send me their cheques made out to "R.A.M.C. War Memorial Fund." Any doctors and their families who are near Blackpool will, I am sure, be interested by a visit to the Exhibition.—I am, etc.,

R. W. GALLOWAY,
Deputy Director of Medical Services,
Western Command.

Chester.

Limits of Certification

SIR,—If I have understood Dr. Desmond Curran's letter (Aug. 2, p. 187), he makes two quite separate points. The first is that it lies within our province to say whether a man is fit to do a particular type of work from either a psychiatric or a physical point of view. That is to say, we can assess his intelligence and stability; and we can say whether he is ill, or if he has suffered from recurrent illness of such periodicity that it is likely he will become ill again. But no doctor *qua* doctor should be asked to go further and *select* from those he passes as fit. Clearly, when, as in this case, he is asked not only to announce fitness but to give a detailed report as well, he is being utilized in a selection procedure of very dubious validity. As Dr. Edward Glover has emphasized (Aug. 16, p. 269), there is danger in failing to distinguish two things—on the one hand legitimate clinical observations which can be at least as precise as those obtained from examining the

heart; and on the other hand the general impressions of an intelligent man, of which doctors hold no monopoly. Indeed, there is remarkably little evidence that doctors can select their own staffs with any more wisdom than is to be found in any other profession or trade. It is still usual, even among psychiatrists, to select men on the basis of their records and behaviour during interview, and one hopes this will continue to be the case and that employment in future will not be restricted to those who can pass unscathed through a searching psychiatric interrogation. In this particular case, selection from among the medically fit should be undertaken by the Civil Service Commissioners themselves or their lay agents in the traditional way; the responsibility should not be accepted by medical men and the choice invested with a spurious authority that will not stand the test of time.

The second point, and separate from the question of our capacity to select, is the rightness of providing such a report for the perusal of a lay body. If the candidate knew exactly how full the report was to be and to whom it was to be transmitted, no question would arise, since communication would be with his consent; but clearly such a report could have little value, for few candidates would be so unwise as to disclose information which would prejudice their chances. It seems improbable, too, that the Commissioners would desire the candidate to be in possession of such information. If he were not, then to me it seems clear that communicating such a report would certainly be wrong, and possibly unlawful, though perhaps there is no judicial decision on this point. Certainly the matter should be clarified, and since your annotation (Aug. 16, p. 260) suggests a doubt as to who would make such a ruling, I would submit with respect that there are at least two possibilities. One is that the Royal College of Physicians should pass a resolution similar to that passed to guide the practitioner faced with a case of criminal abortion. This resolution, even if it has not the force of law, carries a weight of authority that has even earned judicial recognition and acceptance. Secondly, I think it is true that the General Medical Council has jurisdiction conferred upon it by the Medical Act of 1858 which covers certificates or reports which are untrue, misleading, or improper. It is difficult to imagine anything more improper than this.

It is perhaps unnecessary to dwell on the fundamental unpleasantness of the whole business—the searching investigation, the furtive "confidential" report, the secret filing, and possibly the interruption of a career by misinterpretation or overweighting of technical terms by those not equipped to understand them. Perhaps the words of Jeremy Bentham, used in a slightly different context, are relevant:

"In the darkness of secrecy interest and evil in every shape have full swing. Only in proportion as publicity has place can any of the checks applicable to judicial injustice operate. Where there is no publicity there is no justice. The security of securities is publicity."

It is to be hoped that in this matter the lead which Dr. Curran has given will be widely followed, and that what Lord Hewart several years ago spoke of as departmental aggression and bureaucratic pretension will not cause us to forget that we have professional responsibilities as well as privileges.—I am, etc.,

Bristol. GERALD GARMANY.

SIR,—All will agree with Dr. Desmond Curran (Aug. 2, p. 187) and Dr. Edward Glover (Aug. 16, p. 269) in their objection to submitting full psychiatric reports to laymen. Dr. Glover, however, objects to the application of wartime selection methods to civilian life, and implies that betrayal of confidence is a necessary part of the method. In my experience this is not so.

Having been busily concerned with the application of these methods in Army Selection Centres during the last three years of the war I missed Dr. Glover's earlier warnings, so am perhaps at a disadvantage. However, I found nothing to offend the professional code. Psychiatric reports were confidential documents addressed to the senior medical officer, as were the reports of medical, orthopaedic, or any other specialists. Advice to the laymen concerned with the soldier's employment was limited to a brief positive or negative recommendation.

There seems no reason why some such method, applied without compulsion, should not be used to make the most of the nation's manpower during the present crisis. Most of those who have had experience of the method and have been able to study the results objectively are convinced of their value. Many who have benefited from its application in their own cases are of the same opinion.—I am, etc.,

St. Albans, Herts. C. GUY MILLMAN.

The B.M.A. and World Organizations

SIR,—In his letter (Aug. 9, p. 228) Dr. W. H. Spoor asks several questions about the World Medical Association and its relationship with the B.M.A. He is afraid that the W.M.A. will establish a dictatorship to which the B.M.A. will be subordinate. This is a travesty of the facts. The W.M.A. will be a means for the various national medical associations to exchange information, to confer, and to endeavour to bring the opinion of doctors all over the world into a focus and to present that opinion to the World Health Organization and to Unesco, which are organs of U.N.O. on the Government level.

The W.M.A. will have no powers whatever over its constituent bodies other than those of persuasion. Its power in the world will be commensurate with the degree of unity it can influence amongst the doctors of the world, and here its possibilities are great. In view of the long-established ethical standards of our noble, learned, and liberal profession, that power, if attained, should work wholly for the good of humanity.—I am, etc.,

Weymouth. J. A. PRIDHAM.

Leprosy and its Problems

SIR,—The leading article under the above title (June 7, p. 813), in which my name (misspelt as Moisier) was mentioned in connexion with a new theory that cockroaches carry lepra bacilli, suggests that an exposition of this theory may be of use not only to the medical profession but also to the public through professional influence.

Leprosy is indeed a mysterious disease, but all are agreed that an acid-fast bacillus (*Mycobacterium leprae*, or Hansen's bacillus) is the causal agent, though it does not comply with a single one of Koch's postulates. May the mystery not be due to the fact that we have taken for granted that the disease is directly infective from man to man, most probably by contagion? I submit that this is mere supposition. There has never been any proof of the contagion theory. All along opinion has been divided between the contagionists and the non-contagionists—and there is no doubt that at present the former are in possession of the ball. But even they have to admit that the actual mode of transmission is still unknown, so that their theory is not founded on proved facts.

First, the rarity of conjugal infections in leprosy must have struck every worker, and seems to negative the transmission theory. Secondly, if the disease is directly contagious, and is caused by Hansen's bacillus, how can we account for the failure of almost all inoculation experiments? Surely this suggests that the bacillus is not infective when passed from man to man, but that an intermediate host is necessary, in which development must take place in order to render the bacilli infective. Thirdly, if the disease is contagious, how is it that so few doctors, nurses, and orderlies in hospitals have become infected? Few precautions are as a rule taken. Fourthly, how can we explain that so few patients can give a history of contact? In my own experience, no less than 60% of native patients come into this category.

I have become more and more convinced that the mode of transmission must be sought elsewhere—namely, by insects. Cockroaches seemed the most likely, as they exist everywhere and are of ancient origin. My investigations apply only to Southern Rhodesia, Kenya, and Uganda, but I think the results should be widely known, and others induced to carry out their own investigations in other parts of the world, so that we may be enabled to take the correct precautions against spread of the disease, and even to eliminate it altogether. Isolation of the patient, whether voluntary or compulsory, has not hitherto been effective, and cannot be claimed to have eliminated the disease from any part of the world at any time.

But suppose we can pin the blame to the cockroach. That would explain the failure, for we have left the infection behind in the

house of the patient, and leprosy is so obviously a house disease, especially in poor squalid overcrowded huts, where in warm climates cockroaches abound. From one African hut no fewer than 2,500 cockroaches were caught in one night! It is not generally known that cockroaches bite man, and in doing so remove a piece of skin, which they swallow, leaving a small bleeding wound which later becomes a characteristic whitish depressed scar lasting for many months. Neither my African assistants nor I have ever actually seen a cockroach in the act of biting, but there is not the slightest doubt about it. The natives have reason to know the bites well.

In my leprosy hospital these wounds and scars have repeatedly been found to contain Hansen's bacilli, even when the organism could not be demonstrated elsewhere. Children are much more commonly bitten than adults, which probably explains why the disease generally develops in them.

Within the hospital about 23% of cockroaches taken from huts occupied by lepromatous patients are found to contain masses of Hansen's bacilli. Outside the hospital it is not usual to find acid-fast bacilli in cockroaches, though they have been found at times. The bacilli occur in large numbers in the faeces of cockroaches, and can pass from roach to roach by this means, since they feed on anything, from paper, clothing, and blacking to flesh and the dead bodies of other cockroaches. The feeding propensities would explain why, in one kraal from which nine patients had been admitted at various times, the last one five years earlier, acid-fast bacilli indistinguishable from Hansen's were found in a roach caught in a hut. The infection must have remained in that kraal in the shape of infected cockroaches and faeces. Hansen's bacilli have been demonstrated in faeces kept in a stoppered tube for 29 months, and were found to stain as deeply as when fresh.

Now, experimental inoculations of laboratory animals have failed to be of value, as have attempts at cultivation, so that man remains as the only object of experimentation. African natives do not fear the disease, but volunteers should be sought in other parts of the world, and should be inoculated (1) by allowing infected cockroaches to bite them, and (2) with infected faeces. One such experiment has produced suggestive though not conclusive results.
—I am, etc.,

Kenya. BERNARD MOISER.

Prognosis of Pleural Effusion

SIR,—May I at this late date reply to Dr. J. D. L. Reinhold's letter (June 7, p. 824) relating to my paper on this subject published in an earlier issue. The 190 patients concerned were, almost without exception, treated initially with prolonged bed-rest and a convalescent or sanatorium regime, and there was no evidence that differences in treatment of the original pleurisy affected the subsequent incidence of pulmonary tuberculosis. Although I continue to keep such cases in bed at least until their blood sedimentation rate becomes normal, I have the uneasy feeling that in this, as in other manifestations of the evolution of a primary tuberculous infection, its fate depends on factors probably outside of medical control. The essential thing is close observation during the ensuing 12 to 18 months, when most of the phthisis (i.e., tuberculosis that we *can* treat) occurs.

Dr. Reinhold and anyone else who is interested will find a much fuller account of this work, with details of the intra-thoracic lesions encountered before and after the onset of pleurisy with effusion, in the *American Review of Tuberculosis* of October, 1946.—I am, etc.,

Dunedin Hospital, Dunedin, New Zealand. BRIAN C. THOMPSON, Medical Director, Tuberculosis Service.

"The Thalamic Syndrome"

SIR,—I was careful in my previous letter (July 19, p. 109) to limit my criticism of Dr. G. Tayleur Stockings's article to the statements with which he prefaces the account of his work on a euphoriant drug. Work of this type is always valuable if only for the light which it may throw on the mechanism of mental disorder.

My main criticism of Dr. Stockings's article is that he advances his theory that neurotic depression can be equated with thalamic dysfunction as though it were a clearly demonstrable fact. This criticism also applies to his claim that psychotic and neurotic depression can be differentiated by a specific response to "anoxic" therapy. I do not think the evidence so far adduced in support of this claim justifies its being presented to the readers of the *Journal* as though it were a well-recognized fact. Theories are useful where they lead to further research and enable predictions which can be checked to be made. If, however, they are advanced as assertions they will not serve this purpose but will merely serve to confuse the interested reader who has no specialist knowledge of the subject.

In my simplicity I was unable to see any difference between "thalamic syndrome" and "thalamic dysfunction syndrome." I must confess that even after reading Dr. Stockings's explanation (Aug. 2, p. 187) I would still draw the inference if I saw the name of an organ attached to a syndrome (e.g., pituitary syndrome) that the symptoms which compose the syndrome were being attributed to dysfunction of that organ.

I think that the true role of cortex, basal ganglia, thalamus, and other parts of the brain and the relative importance of constitutional defects and external stimuli in the production of mental disorder can only be established as a result of very extensive research in which chemical agents will no doubt play a very important part. Meantime, in order to assess results accurately I believe it is very necessary to maintain clearly the distinction between experimentally proven fact and theories with little experimental support.—I am, etc.,

St. Mary Cray, Kent. BRIAN H. KIRMAN.

"Mushroom" Poisoning

SIR,—The advice given by your annotator (Aug. 23, p. 302) that, unless we are experts, we should not eat any fungus which is not obviously a mushroom is sound, even if it deprives us of the edible fungi described by Mr. John Ramsbottom (p. 304). But unfortunately the really deadly fungus, *Amanita phalloides* (the Death Cap), may be easily mistaken for the edible mushroom and passes the popular (fallacious) tests of edibility. I think, therefore, that emphasis should be given to the fact that the gills of the Death Cap are permanently white, while those of the edible mushroom never are, and that the public should be told, "Never eat a 'mushroom' with white gills."

I have met only two cases of Death Cap poisoning and both patients were moribund when seen. Details of possible treatment were hard to find among the "accumulated mass of clotted bosh" which Mr. Ramsbottom rightly condemns. As "mushroom" poisoning may prove to be a very serious emergency, I suggest the following scheme for any future cases:

1.—If symptoms began within five hours of ingestion, wash out the stomach and leave in it 2 fl. oz. (57 ml.) of "white mixture."

2.—If there are blurred vision, sweating, salivation, or other symptoms suggestive of muscarine poisoning, give atropine gr. 1/50 (1.3 mg.) subcutaneously to an adult.

3.—If the onset of symptoms is delayed over five hours, the doctor should ask himself, "Is it Death Cap poisoning?" In deciding this point, have an expert opinion on any uneaten fungi and on the spores in the vomit. Failing this evidence, a delayed onset of symptoms should make the doctor decide in favour of Death Cap poisoning. There are three possible main lines of treatment, which should be given promptly: (*a*) Obtain and administer anti-phallinic serum: Apply to the Director, Central Public Health Laboratory, London, N.W.9. (Telephone Colindale 6041). The dose will be indicated on the amount sent. (*b*) Commence treatment for failure of liver function (glucose, calcium, vitamin B_1, vitamin K, etc., and possibly blood transfusion). (*c*) The rabbit stomach–brain treatment of Limousin and Petit. This is based on the fact that, while cats die after eating *Amanita phalloides*, rabbits do not. But the juice of *Amanita phalloides* injected subcutaneously into rabbits is fatal, suggesting that the toxin is destroyed or neutralized in the rabbit's stomach. Cats fed on *Amanita phalloides* plus rabbit's stomach survive several days. If the rabbit's brain is given also, they recover completely. The treatment recommended is to give up to 5 uncooked rabbits' brains and stomachs minced up, daily for several days. Its practicability in a vomiting patient seems questionable, but the emergency is so desperate that it should be tried.
—I am, etc.,

Enfield, Middlesex. C. ALLAN BIRCH.

Tuberculosis and Malnutrition

SIR,—Dr. Agnes C. Clark (Aug. 9, p. 226) raises a very interesting point regarding tuberculosis and malnutrition. The usual teaching is that pulmonary tuberculosis occurs more frequently in an undernourished population and tends to be more severe. In her D.P. camp the exact incidence is not stated, but recovery appears to be very quick with the minimum treatment.

The obvious explanation is that the Poles and Ukrainians have some racial immunity to tuberculosis. This, however, has never been proved, and an epidemic of tuberculosis in a Siberian P.O.W. camp reported by Planner-Wildinghof (1921)[1] affected all races equally and was not influenced by any racial difference or any other form of selection.

The other probability is that an undernourished patient, contrary to the usual teaching, is not a suitable host for the tubercle bacillus. Study of the latest Austrian statistics recently acquired in Vienna seems to confirm this.

Pulmonary Tuberculosis in Austria

Year	Notification of Pulmonary Tb.	Deaths from Pulmonary Tb.
1940	8,611	6,086
1941	9,461	5,789
1942	11,777	6,179
1943	13,475	6,204
1944	11,775	7,027
1945	8,916	5,043
1946	12,467	4,900
1947 (first half) ..	6,759	2,118

The notification of cases is, I think, not sufficiently accurate for comparison each year, as cases are now more readily notified in order to obtain the dietary extras for such patients. The numbers of deaths are much more interesting. Until the end of 1944, Austria was presumably one of the better-fed countries of Europe. With the chaos in Austria before and after the cessation of hostilities in 1945 there was mass hunger for the first time, yet the deaths from pulmonary tuberculosis dropped by nearly 2,000 to just over 5,000. Another bad year nutritionally for Austria was 1946, yet the deaths from pulmonary tuberculosis dropped to under 5,000. This was in spite of gross overcrowding in the towns and a shortage of sanatorium and hospital beds. In 1947, after two years of severe malnutrition and a very hard winter, the deaths from pulmonary tuberculosis in the first six months were just over 2,000.

These figures, taken with Dr. Clark's experiences in D.P. camps, suggest that there may be something in the state of malnutrition which prevents the more serious and fulminating types of pulmonary tuberculosis from developing. It is known that by culturing the tubercle bacillus in unsuitable media an attenuated form of the bacillus will be produced (c.f. B.C.G.). The bacillus, for its optimal development and proliferation, requires an adequate supply of oxygen, glycogen, glycerol, and some amino-acids. Could there be some mechanism which interferes with the acquisition of these or other essentials from the depleted supply in the undernourished host? I feel that this subject has so many interesting aspects that it might well be profitable to carry out some intensive investigation in Austria into the problems of resistance to and recovery from tuberculosis, especially as the present conditions in that country will probably never recur.—I am, etc.,

A. MACFARLANE.

REFERENCE

[1] Quoted by Kayne, G. G., Paget, W., and O'Shaughnessy, L. (1939). *Pulmonary Tuberculosis*, p. 57.

Alkaline Haematin Method for Haemoglobin Determination

SIR,—An alkaline haematin method for the determination of haemoglobin was described by Dr. J. W. Clegg and myself in this *Journal* (1942, **2**, 329). The standard recommended in this procedure consisted of a solution of crystalline haemin in sodium hydroxide. The colour of this solution was closely similar to, although not identical with, that of the alkaline haematin solution prepared from blood treated with sodium hydroxide. It suffered from the disadvantage of not being a permanent standard, and it was recommended that new standard solutions be made up at intervals of a few months.

The alkaline haematin method for haemoglobin has recently been re-investigated in the U.S.A. and has been recommended by B. L. Horerker (*J. Lab. clin. Med.*, 1946, **31**, 589). The standard employed is a solution of crystalline haemin in borate buffer *p*H 9.4, which is claimed to be much more permanent than the Clegg and King standard of haemin in sodium hydroxide. The haematin standard in borate has the additional advantage of being more closely similar in colour to the alkaline haematin solution formed when haemoglobin is treated with sodium hydroxide. I have investigated the Horerker standard and find the claims to be fully substantiated. Alkaline haematin standards prepared in borate buffer appear to remain unaltered for nine months, whereas those in sodium hydroxide are much less permanent (they appear now to be less permanent than we had originally found). The spectral curve of the alkaline haematin standard in borate is closely parallel to that of the alkaline haematin solution made from haemoglobin in sodium hydroxide. There is a quantitative difference in the depth of colour, similar to that found with the Clegg and King standard (1.3 times as much haemin is required to give the same colour as haemoglobin, on a molecular basis); but the spectral curve of the haemin in borate is of a similar shape to that of haemoglobin treated with sodium hydroxide, and does not show the differences seen in the curve of haemin in sodium hydroxide. Horecker compares his test and standard solutions with a yellow-green filter and finds a different factor than the 1.3 mentioned above for the quantitative relationship between the colour of haemin and haemoglobin. However, with the green light filters in use here (Chance OGR 1; Ilford tricolour green, spectrum green, and mercury green) the quantitative relationship between the colour of haemin in borate and in sodium hydroxide appears to be the same; and with these filters, therefore, the same quantity of haemin should be used in borate buffer as was specified by Clegg and King for use in sodium hydroxide solutions.

The findings for a series of solutions of different crystalline haemins in borate buffer and in sodium hydroxide solution are given in Tables I and II. It is seen that the average reading of the colour for the different haemin solutions is closely similar for both the borate and sodium hydroxide solutions for any given light filter. The keeping quality of the haematin standard in borate buffer is certainly superior to that in sodium hydroxide solution.

TABLE I.—*Colour Intensities of Various Preparations of Haemin in NaOH and in Sodium Borate*

(Colours read in a King (1942) photoelectric colorimeter with Chance and Ilford light filters, and in a Hilger absorptiometer with Ilford spectrum yellow-green light filter)

Preparation of Haemin		Specific Extinction Coefficients of Haemin Solutions. (Es for 1 mg. Haemin Iron per 100 ml. Solution)*							
		Haemin in NaOH Solution†				Haemin in Borate‡			
No.	% Iron	Chance Green Filter	Tri-colour Green Filter	Mer-cury Green Filter	Yellow-green Filter	Chance Green Filter	Tri-colour Green Filter	Mer-cury Green Filter	Yellow-green Filter
16	8·41	0·810	0·806	0·646	0·742	0·821	0·777	0·623	0·741
17	8·26	0·854	0·838	0·672	0·772	0·835	0·816	0·642	0·767
19	8·13	0·857	0·843	0·669	0·774	0·855	0·835	0·654	0·777
26	8·36	0·855	0·836	0·666	0·765	0·843	0·821	0·646	0·768
28	8·00	0·834	0·821	0·660	0·754	0·835	0·816	0·645	0·770
30	8·42	0·816	0·799	0·638	0·730	0·810	0·797	0·625	0·741
DGH	8·03	0·878	0·857	0·677	0·793	0·858	0·842	0·660	0·790
Mean ..		0·843	0·829	0·661	0·761	0·837	0·816	0·642	0·764
Coeff. of variation (%)		2·68	2·62	2·14	2·81	2·04	2·85	2·15	2·36

* The photoelectric readings (extinctions) of these solutions were appropriately factored by the weights of haemin taken and the percentages of iron in the haemins, to give the readings (specific extinction coefficients) which would have been obtained had 100 ml. of each standard solution contained an amount of haemin equal to 1 mg. of iron, and when the solutions were read in the colorimeter at a depth of 1 cm.

† Approximately 40 mg. haemin dissolved in 500 ml. 0·1 *N* NaOH.

‡ Stock solution: approximately 40 mg. haemin dissolved (overnight) in 50 ml. of Sorensen's borate buffer *p*H 9·4. Aged for two days in ice-box. Standard: 50 ml. of stock, diluted to 500 ml. with same buffer.

TABLE II.—*Stability of Standard Solutions of Haemin in Sodium Borate*

(Mean specific extinction coefficients of seven alkaline haematin standards read at various times after preparation)

Age of Solutions	Haemin in Borate Buffer *p*H 9·4			
	Chance Green Filter	Tricolour Green Filter	Mercury Green Filter	Yellow-Green Filter
2 days	0·837	0·816	0·642	0·764
2 months	0·838	0·821	0·650	0·770
4 „	0·845	0·828	0·660	0·759
9 „	0·850	0·822	0·659	—
1 year	0·783	0·778	0·636	0·720

The standard recommended now is a solution of 79.4 mg. of pure crystalline haemin (8.57% iron) or an equivalent amount of another crystalline haemin of lesser iron content (for example 81 mg. of a haemin of 8.41% iron: $\frac{79.4 \times 8.57}{8.41} = 81$), dissolved in 100 ml. of Sorensen's sodium borate buffer *p*H 9.4,* kept for two days in the ice-box and then diluted to 1 litre with the same borate buffer. (Equivalent to 100% of Haden normal; 15.6 g. haemoglobin per 100 ml. of blood.)

Gibson and Harrison (*Biochem. J.*, 1945, **39**, v, 490) have recently described an artificial standard consisting of a sulphuric acid solution of potassium dichromate, chromium sulphate, and cobalt sulphate. It has been found very satisfactory in this laboratory. It is apparently permanent and the colour is almost identical with that of alkaline haematin solutions formed by treating haemoglobin with sodium hydroxide.—I am, etc.,

British Postgraduate Medical School,
London, W.12. E. J. KING.

Bornholm Disease in Children

SIR,—The report by Drs. W. M. Jamieson and D. M. Prinsley (July 12, p. 47) prompts us to record an outbreak of Bornholm disease in the Halesowen area of Worcestershire, in which 48 children were seen by us in general practice. We must emphasize that it was not until we had treated twelve cases that we were able to provide a diagnosis, and then when we realized that a disease of infectious nature had occurred many investigations we would like to have carried out were not possible for various reasons.

So far as we know Bornholm disease is a syndrome, and if this is not recognized the diagnosis is perplexing. We believe it is spread by droplet infection. Headache, grunting respirations, and subcostal or abdominal pain would appear to be the main complaints in this disease. A reference to the literature available to us describes this condition as epidemic myalgia, epidemic pleurodynia, acute benign pleurisy, and epidemic muscular rheumatism, none of which seems to fit the clinical picture. The *British Encyclopaedia of Medical Practice* states that the disease occurs chiefly in the late summer months, and attacks the sexes equally, those under puberty being more susceptible.

The first cases were seen early in May. The peak was reached in mid-June and continued until the third week of July, since when only two fresh cases have been treated. Forty of the cases were seen in Halesowen, the other eight being from a country village six miles away. The affected children were between the ages of 2 and 10. Those of school age did not all attend the same school, and the children living in the country district did not attend the schools in Halesowen. There was no noticeable predilection for either sex. The incubation period was between two and eight days. The onset was generally acute, the patient complaining of severe frontal headache which became more intense on pressure, and subcostal or abdominal pain. Three children complained of subcostal pain, and this they said radiated round to the back and was increased by inspiration. Those with abdominal pain described it as sharp and stabbing, occurring intermittently. Vomiting was present in several cases, but no diarrhoea was reported. In a few children there was a history of general malaise for three to four days before the attack.

The children were all obviously ill. The temperature when first seen was in the region of 103° F. (39.4° C.) and never below 102° F. (38.9° C.). Slight injection of the fauces was frequent. Most cases had rapid grunting respirations. No abnormal breath sounds or pleural rubs were detected and the heart sounds were normal. Examination of the abdomen showed tenderness of one side—mostly the left—and there was guarding of the muscles. Rectal examination was negative. Kernig's sign and neck rigidity were not found, nor any lesion of the nervous system. The urine was normal, apart from traces of acetone.

The first twelve cases received nothing but aspirin, and they recovered in ten days, followed by marked weakness. We then tried the effect of sulphathiazole and found that the children felt perfectly well in three to four days. There were three exceptions to this. The condition of the child seemed quite satisfactory until seven days after the apparent cure, when the whole history of events was repeated. A further course of sulphathiazole was given, and the children made a complete recovery. The dose of the drug was 6 to 12 g., according to age, and the cases which relapsed were given a repeat dosage. One child was *x*-rayed after his relapse, and a small area of consolidation was found in both lungs in the mid-zones. This child had one symptom not mentioned by the others: when his attacks of abdominal pain occurred he wanted to pass water. Two weeks later he was again *x*-rayed and his chest was reported clear. Examination of four throat swabs showed *Staph. aureus*; examination of four stools showed no organisms.

As stated above, we had extreme difficulty, before we realized that an outbreak was present, in approaching our cases. Pleurisy, pneumonia, acute abdomen, and meningitis were considered.—We are, etc.,

Halesowen, Worcs. H. W. BLAND,
G. T. NEWTON.

REFERENCE

Rolleston, Sir Humphry (1938). *Brit. Ency. Med. Pract.*, **2**, 588, London.

Irradiation of Gastric Cancer

SIR,—I am glad to see that interest in the above subject is being revived, and I am sure that it is a field which will repay further exploration. In their article in the *Journal* of Aug. 16 (p. 243) Dr. G. Cranston Fairchild and Mr. Alan Shorter state that direct irradiation of carcinoma of the stomach was first conceived and reported by Fairchild in 1935. Under the heading "A New Method of Approach in Gastric Surgery" in the *Journal* of Feb. 23, 1929, I reported two cases where this method had been used in 1923 and 1924. The object of my paper was to draw attention to the possibility of converting an inoperable into an operable case by preliminary direct irradiation, and in both cases a successful resection was carried out after an interval of six weeks. Both patients were alive at the time that paper was written—in the one case five and a half years and in the other four and a half years after operation.—I am, etc.,

Leeds. DIGBY CHAMBERLAIN.

Diathermy Dissection of the Gall-bladder

SIR,—I have read the annotation (July 5, p. 21) as well as Mr. R. J. McNeill Love's article (p. 11) on the subject. Obviously, I feel satisfaction about the tribute paid to my electrosurgical operation, which I have developed in all its details in the years 1928–32, so that hardly any chance was left for modifications. But I am rather surprised that this operation apparently has to be rediscovered time and again, and I am compelled to attribute this fact to my inefficiency in giving the method sufficient publicity.

However, it is a fact that in the *Lancet* of March 26, 1938 (p. 750), and of Oct. 28, 1939 (p. 927), I again published an account of my experiences, reviewing at that time more than 1,000 cases. Moreover, as far back as 1932 at the International Congress for Liver Diseases at Vichy I showed two films of electrosurgical cholecystectomy. In one, with a simple empyema, the serosa as covering for the liver bed could be preserved. In the other, a phlegmonous wall of the gall-bladder with abscesses in the liver bed could be demonstrated where the gall-bladder had to be entirely dissected with the diathermy knife and the liver abscesses had to be electrocoagulated radically deep into the liver parenchyma. The abdominal wall was primarily closed and the patient could be dismissed after fourteen days.

Since my first publication in 1928 my method has been widely adopted on the Continent, and in South America especially introduced by P. Mirizzi (1933). M. Thorek has the credit of being the first surgeon to apply this operation in North America in 1934, and Hamilton Bailey and McNeill Love to have applied it first in England (1939).

It is an old, time-honoured tradition in our profession that any trying out of a new method is started with "modifications." In the special case of electrosurgical cholecystectomy—with the exception of M. Thorek's grafting of the falciform ligament—no modification has been recommended which the originator has not already tried out and published.

In the case of an intact serosa, I consider it a wrong move not to spare this valuable tissue for covering, as much as possible. It has proved to be better than any grafted tissue. Furthermore, I feel that many communications on electrosurgical cholecystectomy do not stress enough the necessity of a careful dissection of the cystic duct from the neck down to the common duct, and of an exact exposure of the dangerous

*900 ml. of 0.05 *M* borax + 100 ml. 0.1 *N* NaOH.

"eternal triangle" which gives the "second-hand surgeon" so much trouble when operating for "benign strictures." When this dissection is properly done, enough serosa flaps always are found to cover the cystic duct and at least the lower part of the liver bed. When grafting is required, omentum is by far the best tissue. Only in one case, where the region of the cystic duct was blocked by an overlying tumour consisting of a bladder-colon fistula, I left the whole region untouched and was satisfied with the radical electrocoagulation of the opened bladder from inside without tying the cystic duct. The result, in a woman of 50 years of age handicapped by a severe thyreotoxicosis, was excellent.

May I be permitted to give a very brief summary of my experiences with electrosurgical cholecystectomy? This should positively be the operation of choice in badly infected cases in preference to the old cholecystectomy. It sterilizes the whole infected field and prevents the spreading of peritonitis beyond the operating field, still the main cause of a fatal outcome in most statistics. This can best be illustrated by the fact that not one single case of fatal issue through postoperative peritonitis was observed since 1928. The sterilizing effect of the operation can further be seen by the fact, since confirmed by all observers, that the abdominal wall can be closed also in badly infected cases.

Electrosurgical operation is the best method of dealing with liver abscesses and is, in poor-risk cases, well able to replace cholecystostomy, an operation which I have abandoned since the development of the electrosurgical cholecystectomy.—I am, etc.,

New York City. B. O. C. PRIBRAM.

Penicillin and Blood Coagulation

SIR,—When penicillin powder was introduced for insufflation into wounds after incision I noticed that a wound which had been rendered "dry" began to bleed again after the application of penicillin powder, and occasionally I even found it necessary to secure points which, before the application of the powder, had not been bleeding. Sometimes this bleeding was very troublesome in, for instance, extensive limb injuries with much muscle damage.

It was therefore with considerable interest I read the article by Sir Alexander Fleming and Dr. E. W. Fish (Aug. 16, p. 242) and which explains a phenomenon which I am sure many surgeons operating on war wounds must have observed.—I am, etc.,

Whiston, Lancs. W. N. CHISHOLM.

Acute Non-specific Diarrhoea and Dysentery

SIR,—I should like to associate myself with the remarks of Dr. G. L. Morgan Smith (Aug. 2, p. 189). During six years' service in India (one year in the Punjab, two in the N.W.F.P., and three in Hyderabad, Sind), and four years in Hong Kong, I never saw a case of diarrhoea which could be unequivocally ascribed to chilling of the abdomen. Personally, when the weather was very hot I invariably slept naked under a fan, and never suffered any ill effects, in spite of the warnings of some of my colleagues and of old "Koi Lais" who informed me that my demise under such conditions would be rapid.

I found that the greatest incidence of diarrhoea occurred (*a*) in the recent arrivals from temperate climates, and (*b*) during the winter and early spring, when flies were most prevalent; and I am quite convinced that food or water contamination is responsible for these outbreaks. Anyone who has had any experience of the hygienic conditions of the average cookhouse in India and other tropical countries can only be amazed that gastro-intestinal infections are not more frequent. (This particularly applies to officers' messes, which are generally the least inspected and most unhygienic of any.)

The attitude of mind of those who perpetuate this myth of "chilling of the abdomen" is further exemplified by the (until recently) prevalent ideas about so-called "sunstroke." I have never met anyone who could claim to have seen a fully authenticated case of sunstroke, though I have myself seen several cases of heat-stroke, which usually occurred in the evening when the humidity increased. While in the Tropics I never wore a *topi* except in uniform, when it was compulsory, and frequently went about without a hat at all, in spite of the many warnings I received. I feel sure that a lot of harm has been done to the European resident in the Tropics by Kipling's lines: "But the worst of your foes is the sun overhead," because it caused unnecessary emphasis to be placed on the *topi* and spine-pad.

In my opinion, the value of a *topi* lies not in the material from which it is made but in the better ventilation it affords by reason of the corrugated head-band around the rim. The criterion I used, both as regards heat and cold, was comfort. Any type of hat, if worn for long periods in the hot sun, will cause sweating and discomfort. Its temporary removal allows evaporation of the sweat, and therefore cooling. In the same way a fan allowed to play on the naked body in bed permits one to obtain that necessary amount of sleep which is essential. Should the temperature drop during the night the bodily reactions will very soon warn one, and one can either turn off the fan or pull up a sheet.

Provided one is in reasonable health, Nature, through our own sensations, will indicate our necessities.—I am, etc.,

H. G. ROBERTSON,
Lieutenant-Colonel, R.A.M.C.

An Infants' Pharyngoscope

SIR,—An infants' pharyngoscope, which I designed several years ago, has since proved extremely efficient. It is simply a pharyngoscope blade that can be adapted to any auriscope. This makes it a valuable adjunct to a practitioner's kit. The pharyngoscope blade has a bayonet catch for use on any electric auriscope, the long length is 3 inches, the short length 2 inches, and the cut-out portion 3/8 inch. It is nickel-plated, made by Down Bros. and Mayer and Phelps.

It fits into the auriscope in the same way that the different sized aural funnels do, and the light from the auriscope bulb, projected along the hollow blade, gives an excellent illumination of the infant's larynx. With the aid of any cranked sinus forceps (I use St. Clair Thomson's cranked forceps), a size No. 4 Jacques rubber catheter can be inserted easily into the trachea. If this is connected up to a low pressure oxygen supply, which is bubbling at the rate of forty bubbles a minute, it will keep sufficient oxygen in the bronchioles to sustain the child until it can recover from its shock and take over breathing on its own initiative. This is useful in cases of asphyxia pallida, especially after operative delivery or prolonged labour where the limp infant refuses to make any attempt at respiration.—I am, etc.,

Littleover, Derby. LINDSAY O. WATT.

Care and Treatment of Elderly and Infirm

SIR,—The report of the B.M.A. Committee on the Care and Treatment of the Elderly and Infirm (*Supplement*, June 21, p. 133) is very promising, and a step in the right direction. One important group of elderly patients which does not seem to be provided for is that of the old pulmonary tuberculous patient with a positive sputum. The curtailment of the disease generally depends a lot upon the early diagnosis and isolation of these patients. It is hoped that separate accommodation, or communities, suitably equipped for these old patients, will be provided in the proposed geriatric service, their medical treatment being under the supervision of tuberculosis officers.—I am, etc.,

Stafford. CHARLES D. ROSS.

"Golden Ointment"

SIR,—Might I through your columns make an appeal to hospital ophthalmic departments not to make up atropine ointment with yellow vaseline. Time and time again in general practice one is confronted with patients with a dilatation of one or both pupils, photophobia, and great alarm due to the use in minor irritations of "golden ointment" given to someone else by a hospital. All yellow ointment emanating from a hospital eye department is assumed to be the household panacea for eye ailments. We know quite well that one should not use other people's medicine, but it always has been done and always will be, human nature being what it is. I feel sure it would be equally easy for hospitals to make up atropine with white petroleum jelly or other medium and thus avoid this confusion in the eyes of the ignorant public.

While on the subject of hospitals I would like to make another appeal which I shall repeat at a later date with your permission, Sir. It is to standardize the size of the notepaper used by consultants. At present we are faced with a wide range of shapes and sizes of letters which make filing a cumbersome and untidy business. I would suggest a sheet which when folded in two is slightly smaller than the N.H.I. envelope. If we decide to accept National Health Service I have no doubt that a similar system of envelopes for case histories will be issued and possibly just the same size as at present. It may be that under bureaucracy a standard form of hospital report will be devised and issued which in all probability will *not* fit the envelopes, having been invented by a different department on the usual principle of never letting your right hand know what your left hand is doing with which we are so familiar. Meantime, while we have the chance let us help ourselves and use the brains God gave us.—I am, etc.,

Fitzwilliam, nr. Pontefract. J. S. LAURIE.

POINTS FROM LETTERS

Milk in Schools

Dr. G. BAYTON FORGE (Salisbury) writes: I practise in one of the largest milk-producing districts, and the farmers here state far more milk is being produced than ever before. Yet there is none for my poor old patients and none for cheese. . . . It was told me only a few weeks ago that in a large school near London it was no uncommon thing for 80 milk rations to be wasted from absenteeism. It *should* be collected, but the bare fact stands out it is *not*. . . . I state most emphatically milk should be decontrolled and the issue to schools stopped. There would then be plenty for the old people and plenty for cheese, saving dollars.

Medical Education—General Training

Dr. FLORENCE M. E. DAVIES (Corwen, Merionethshire) writes: In one of your recent numbers it was suggested that medical students should have instruction in sociology. I disagree: by all means let them learn about life—by living it! For two years, say from 15 to 17 or 16 to 18, if a lad has passed his matriculation or equivalent entrance examination, let him really knock about and rough it. For instance, a voyage as a deck-hand; service in the Army or R.A.F.; as an agricultural labourer, or a miner or factory hand. Turn him out after his first year of work in any of the above occupations with £1 in his pocket and with no help from relatives or friends, and see how he fares when left entirely to his own resources. We don't want supercilious young fops signing "fit (or unfit) for work" but medical men who have actually been through the mill themselves.

Poliomyelitis

Dr. MURIEL B. O'DOHERTY (Belfast) writes: Poliomyelitis, because of the finding of the virus in the faeces, would appear to commence as an intestinal infection. Its seasonal incidence in Great Britain coincides with the appearance of soft fruits in the shops. In India, where the seasonable incidence was not so clear-cut, the appearance of cases coincided with the availability of soft fruits (apricots, etc.) to the troops. Strawberries have deteriorated because of virus diseases, the virus entering the plant by insect agency (the strawberry aphis), and now the Ministry of Agriculture have insisted that strawberry plants cannot be sold without a certificate. I suggest that some of the viruses causing disease in the soft fruits are neurotropic in man (and monkeys), and that either poliomyelitis is spread by ingestion of these diseased fruits or the infection is spread to food by an insect vector. Making jam of fruit, of course, will kill the virus.

Obituary

SIR THOMAS CAREY EVANS, *M.C.*, F.R.C.S.

Sir Thomas John Carey Evans, late I.M.S., sometime surgeon to the Viceroy of India, and formerly medical superintendent of Hammersmith Hospital, died suddenly at his home in Criccieth on Aug. 25, at the age of 62.

The eldest son of Dr. R. D. Evans, J.P., of Blaenau Festiniog, he was born in 1884 and was a student successively at University College, Cardiff, Glasgow, St. Bartholomew's Hospital, and Vienna. He took the M.R.C.S., L.R.C.P. in 1905 and the F.R.C.S. five years later. After qualifying he acted as house-surgeon at the Royal Southern Hospital, Liverpool; as resident medical officer of the Eastern Dispensary, London; and later as senior clinical assistant at Woodilee Asylum. He entered the Indian Medical Service in 1907 and was surgical specialist with the 8th Lucknow Division and to the Abor Expedition. During the 1914–18 war he served with distinction in Egypt and Mesopotamia and was three times mentioned in dispatches. Returning to the I.M.S. he held a number of senior posts, including that of resident medical officer to the State of Mysore. At this time he was appointed surgeon to the Viceroy.

After leaving India he became medical superintendent of Hammersmith Hospital, and he was also on the staff of St. Paul's Hospital for Genito-Urinary Diseases and the Hospital for Tropical Diseases, London. He was for many years active in the Royal Society of Medicine, the Harveian Society, and the Hunterian Society. He was made a Chevalier of the Légion d'Honneur in 1919, and was knighted in 1924. Among his contributions to the medical press were papers on the surgery of amoebiasis, prostatic enlargement, and litholapaxy. He had been a member of the British Medical Association for over forty years.

In 1917 he married Olwen Elizabeth, daughter of the late the Right Hon. David Lloyd George, who was created Earl Lloyd George of Dwyfor in 1945. Barely a year ago he bought Eisteddfa, an estate near Criccieth, and took up again an early interest in farming.

Dr. NORMAN HOWARD MUMMERY died on July 20 at the age of 70, and industrial medicine lost one of its pioneers. He trained at University College, London, and graduated M.R.C.S., L.R.C.P. in 1902. In the 1914–18 war he had the unusual experience of serving in both the medical branch of the Royal Navy and the Royal Army Medical Corps, reaching the rank of lieutenant-colonel. In 1924 he was appointed whole-time medical officer to J. Lyons and Company, London, thus finding an opportunity to plan and administer one of the first large factory clinics in the country. He had a passion for detail, and his organization at Cadby Hall was outstanding in its time. When the Association of Industrial Medical Officers was formed in 1935 Howard Mummery, recognized then as a leader in his branch of medicine, was unanimously elected its first chairman. Much of the success of this society is due to his untiring efforts. His tact in the chair, his strength of character—amounting often to paternal sternness—his wide knowledge of his subject, and his mastery of administrative method did much to oil the wheels of early meetings when tenseness in discussion could well have caused disharmony. At the end of 1936 he resigned his appointment in industrial medicine and settled in St. Helier, Jersey. He looked forward to a quiet retirement, but his clinical urge persisted and within a few months he began consulting work in dermatology, a branch of medicine in which he was specially experienced. The whole of his social existence was soon to be disintegrated, however, for he left the island only some hours before its invasion by the Germans in 1940. Return to England meant a return to industrial medicine. At the Bristol Aeroplane Company, and with other firms, his experience was once more placed at the disposal of industry, this time as his contribution to the war effort. But as the war drew to a close his health began to fail, and once again he retreated to Jersey, where he died. Industrial medicine was enlarged in no small measure by his work and example.

Dr. WILLIAM STANLEY HEBERDEN died in Johannesburg on Aug. 3. He was born at Ranmore, Surrey, in 1864, and was a direct descendant of William Heberden. He graduated from St. George's Hospital in 1889 and soon afterwards went to

South Africa, where for seventeen years he was one of the senior surgeons on the staff of the Johannesburg General Hospital. He retired from active practice in 1925 and from then up to a year ago he was the chief medical adviser to a number of insurance companies. He is survived by his widow, three daughters, and a son, who is a student of medicine at the University of the Witwatersrand.

Dr. WILLIAM SEYMOUR, who was 68, died suddenly on Aug. 14, and his death will have come as a shock to his colleagues and a host of close friends in Newcastle and the North of England, where he had been engaged in the special branch of anaesthetics for thirty-five years. He graduated M.B., B.S. at Durham in 1906, and in his early student days was regarded as one of the best all-round athletes in the North. He was more than a useful amateur boxer, a fine centre-three-quarter, captained Northumberland and Durham 'Varsity in rugby football, and was chosen as reserve for England on several occasions. He also captained his university cricket eleven. Seymour was also no mean golfer, but his greatest enjoyment was a day or night of fly-fishing for salmon or sea-trout in his beloved Esk or Liddle rivers, which he knew from boyhood from their source to the Solway. He will be greatly missed by his surgical colleagues, to whom he gave loyal and faithful service at any hour of the day or night, and who recognized in "Bill" Seymour a sound and competent anaesthetist, one upon whom they could rely in cases of difficulty and danger. Among other appointments, all of which he had more or less recently retired from owing to other calls upon his time, he was one of the "morning list" anaesthetists on the staff of the Royal Victoria Infirmary, Newcastle, for over thirty years. He served abroad in the first world war as a captain, R.A.M.C.(T.F.), and was for some time attached to an Australian hospital unit at Boulogne, where his skill so impressed the surgical staff that they gave him a warm invitation to return with them to Australia after the war and practise his specialty there. Seymour was so conservative that he eschewed all new ideas in anaesthetics—he never even appeared to wish to familiarize himself with them—and he adhered to the open mask or his Junker bottle connected to his own design of gag for continuous anaesthesia in operations about the mouth, throat, or nose. In the administration of chloroform and ether with a high proportion of air and warm oxygen (passed through a second connexion on his gag) Seymour was unsurpassed anywhere, and he frequently used to remark that only by this method could he keep in such close personal touch with his patient's progress and condition. In over one hundred thousand anaesthetics given by him he had five so-called anaesthetic deaths, one being a case with a large tumour of the brain. Seymour was a non-smoker, practically a teetotaller, and very fit for his age, looking as if he would go on for ever. His sudden passing leaves a gap which many of us so long associated with his ungrudging services and help will find it almost impossible to bridge. He was a man for whom his colleagues felt a real affection. We offer our heartfelt sympathy to his widow, son, and daughter.—W. F. W.

The Services

Major (now Temporary Lieutenant-Colonel) N. G. G. Talbot, O.B.E., R.A.M.C., has been awarded the Efficiency Medal (Territorial).

Surgeon Lieutenant-Commanders T. H. Pierce and F. J. S. Gowar, R.N.V.R., have been awarded the R.N.V.R. Officers' Decoration.

MEDICAL DEPARTMENT OF THE NAVY

The address of the Medical Department of the Navy, on and after Sept. 1, will be Queen Anne's Mansions, St. James's Park, London, S.W.1 (Tel.: Whitehall 9444).

The 49th annual meeting of the Board of the Scottish Mental Hospitals Pathological Scheme was held at the Royal College of Physicians, Edinburgh, on June 13, with Prof. Sir David Henderson in the chair. Prof. Drennan points out in the Report that their laboratory is now established as the University Laboratory for Neuropathology, while continuing the special research aims for which it was conceived nearly fifty years ago. An atlas of neuropathology based on material from the laboratory will shortly be published in Edinburgh. Members of the Executive Committee are as follows: Prof. Sir David Henderson (Chairman), Dr. W. N. J. Chapman, Dr. J. C. Anderson, Prof. T. J. Mackie, Dr. T. R. Spence, Dr. W. Boyd, Dr. John Chalmers, Dr. G. M. Bell, and Dr. W. D. Chambers (Hon. Secretary and Treasurer).

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Allan Menzies McFarlan, M.B., B.Chir. (Magdalene College), has been appointed to the Readership in Human Ecology from Oct. 1.

Rowdon Marrian Fry, M.R.C.S., L.R.C.P., and Joan Mary Boissard, M.R.C.S., L.R.C.P., have been appointed University Director and University Assistant Director respectively of the Public Health Laboratory Service for three years from Oct. 1.

Michael George Parke Stoker, M.D. (Sidney Sussex College), has been appointed University Demonstrator in Pathology for three years from Oct. 1.

Title of degree of M.D. was conferred by diploma on E. Rhodes (Girton College) during July.

The following medical degrees were conferred on Aug. 2:

M.D.—J. R. Bignall, E. M. Griffin, G. A. Emmerson, T. W. Letchworth, W. P. U. Jackson, M. G. P. Stoker, R. G. Mathers.

M.B., B.CHIR.—*M. H. Lessof, *H. W. Cornford, *G. R. Faber, *B. G. Parsons-Smith, *L. G. R. Wand, *A. F. Crick, *J. L. Moffatt, *E. E. Philipp, *M. P. Spence, *P. G. Treharne, *R. G. Law, G. C. Manning, *S. H. F. Howard, *A. W. Robinson, *F. C. Stallybrass, *I. W. Stoddart, M. A. J. Browne, J. H. Garson, K. O. George, C. L. Grandage, J. G. Harrison, H. B. Kidd, D. C. Morley, J. K. P. Perera, D. H. Richards, G. W. Sykes, *T. R. Maurice, *P. K. Pybus, *J. H. Scouler Buchanan, *M. de B. Daly, *W. D. Foster, *R. V. Gibson, *D. J. Howell, *B. T. Kieft, *J. A. McDonald, *J. McFie, *K. M. McNicol, *R. C. S. Pointon, *R. H. B. Protheroe, *M. G. Rolfe, *A. J. Russell, *N. Tate, *G. E. Thomas, G. S. Plaut, *A. B. Douglas, *D. K. Ford, A. W. Ferguson, J. G. Goodhart, M. Harington, E. P. H. Shortt, *I. D. Mackichan, *R. E. V. B. Young, *M. C. Edmond, *A. G. Freeman, *R. E. D. Harvey-Samuel, *J. D. Burton, *L. E. McGee, *J. M. Palmer, *C. W. Hollingsworth, *E. Sherrah-Davies, *W. H. Barker, *T. G. Osmond, *J. A. Tutton, *A. P. Waterson, *P. M. Yeoman, W. E. C. Astle, N. B. Finter, S. M. Vine, *Pow-Meng Yap, S. B. Bennett, R. C. Read, *F. G. Herman.

* By proxy.

UNIVERSITY OF MANCHESTER

At a Graduation Ceremony on July 5 the following medical degrees were conferred:

M.D.—F. P. Ellis (gold medal), R. W. Burslem, A. I. Goodman, A. D. Leigh (*in absentia*), S. B. Rampling, T. P. Sewell, I. Sutton.

QUEEN'S UNIVERSITY, BELFAST

At a Graduation Ceremony held on July 9 the following medical degrees were conferred:

M.D.—*T. Freeman, †R. D. G. Creery, †‡G. W. Csonka, †F. G. C. Walker, J. H. Adams, J. L. Blair, C. F. Campbell, J. S. Elwood, P. A. H. McC. Foster, J. G. Gibson, E. H. Gordon, W. Johnston, R. J. Kernohan, Alice I. M. Leach, A. R. Lyons, W. J. McLeod, R. P. Maybin, ‡R. S. Murray, A. S. Ramsey, ‡B. E. Swain, N. H. Wass, R. J. Wright.

M.B., B.CH., B.A.O.—C. A. G. Armstrong, Joan G. H. Bennett, H. C. Boyd, J. S. Brown, J. A. Byrne, Pauline M. Charlton, J. G. Clearkin, R. T. Cooke, J. Erwin, J. Fulton, R. S. Gibson, F. S. Grebbell, Mary Gunning, Mary E. C. Henry, G. Hughes, G. J. G. Irvine, Anne W. Kilpatrick, W. G. Liggett, T. E. C. Linton, H. McC. McAdoo, Irene S. McCaughey, E. G. McClean, R. L. McCorry, C. McDowell, D. J. McSparran, J. D. Morrow, P. N. Newsam, G. S. Parkes, A. Reid, Kathleen J. Reid, P. N. Ronaldson, J. Shanks, R. L. Turner, J. Weatherup, Elizabeth M. Wells.

* With high commendation. † With commendation. ‡*In absentia.*

ROYAL COLLEGE OF SURGEONS OF ENGLAND

The first meeting of the Board of the Faculty in Dental Surgery of the College was held on July 31. The Members of the Board are as follows: Sir Alfred Webb-Johnson, Bt., P.R.C.S., Sir Cecil Wakeley, K.B.E., C.B., F.R.C.S., and Mr. L. E. C. Norbury, O.B.E., F.R.C.S. (all *ex officio*), and H. A. Mahony, Ph.D., F.D.S., Principal Dental Officer, Ministry of Health, Prof. H. F. Humphreys, O.B.E., *M.C.*, M.B., Ch.B., F.D.S., Director of Dental Studies, Birmingham University, Prof. H. Stobie, F.R.C.S., F.D.S., Dean, Royal Dental Hospital, Prof. F. C. Wilkinson, M.D., F.D.S., Dean, Turner Dental School, University of Manchester, Alan Shefford, O.B.E., F.D.S., Sub-dean, University College Hospital Dental School, W. Kelsey Fry, C.B.E., M.C., M.R.C.S., L.R.C.P., F.D.S., Consultant, Ministry of Health and Royal Air Force, V. A. F. Greenish, F.D.S., Examiner for the L.D.S., R.C.S.Eng., E. W. Fish, M.D., F.D.S., Chairman of the Dental Board of the United Kingdom, Major-General A. B. Austin, C.B., F.D.S., Honorary Dental Surgeon to the King, Director, Royal Army Dental Corps, Prof. T. Talmage Read, F.R.F.P.S., F.D.S., Warden, Dental School, University of Leeds, Surgeon Captain (D) J. T. Wood, C.B.E., L.D.S., Honorary Dental Surgeon to the King, Deputy Medical Director-General of the Navy for the Dental Services, W. G. Senior, O.B.E., Ph.D., F.D.S., Dental Secretary, British Dental Association, H. T. Roper-Hall, M.B., Ch.B., F.D.S., Chairman, Education Committee, Dental Board of the United Kingdom, Edward Samson, F.D.S., President, British Dental Association, A. C. Deverell, F.D.S., Director, Eastman Dental Clinic, Royal Free Hospital, Air Commodore G. A. Ballantyne, C.B.E., D.F.C., F.D.S., Honorary Dental Surgeon to the King, Director of Dental Branch, Royal Air Force, F. S. Warner, F.D.S., Sub-dean, Guy's Hospital Dental School, Prof. R. V. Bradlaw, M.R.C.S., L.R.C.P.,

F.D.S., Dean, Sutherland Dental School, Newcastle-upon-Tyne, W. L. Boness, L.D.S., Vice-chairman of Council, British Dental Association, A. C. McLeod, L.D.S., Honorary Dental Surgeon to the King, and C. L. Endicott, L.D.S., Orthodontist.

Prof. Bradlaw was elected the first chairman of the Board and the Board expressed its appreciation to the Council of the College in creating the Faculty of Dental Surgery and establishing the Fellowship in Dental Surgery. It was felt that the decision to do so would be welcomed by dental surgeons throughout the Empire and would lead to the advancement of dental science everywhere. The intention of the Board was to encourage the Hunterian ideals in dental surgery. The members of the Board dined with the President and Council of the College in the evening, when speeches were made by Sir Alfred Webb-Johnson, Prof. Bradlaw, Dr. Fish, and Mr. Samson.

The following lectures will be delivered at the College (Lincoln's Inn Fields, W.C.) at 5 p.m. each day. Monday, Sept. 22, Moynihan Lecture by Mr. Arthur W. Allen, President Elect of the American College of Surgeons, "Duodenal Ulcer: A Comparative Survey of Two Groups of Patients, one treated by Sub-total Gastric Resection and the other by Vagus Nerve Interruption"; Tuesday, Sept. 23, Cecil Joll Lecture by Dr. Frank H. Lahey, director, Lahey Clinic, Boston, U.S.A., "Hyperthyroidism"; Wednesday, Sept. 24, Moynihan Lecture by Mr. William E. Gallie, professor of surgery in the University of Toronto, "Recurring Dislocation of the Shoulder"; Thursday, Sept. 25, Lister Oration by Mr. Evarts Graham, professor of surgery in the University of Washington, "Some Aspects of Bronchiogenic Carcinoma"; Monday, Sept. 29, Hunterian Lecture by Prof. Hassan Ibrahim, "Bilharziasis and Bilharzial Cancer of the Bladder"; Tuesday, Sept. 30, Hunterian Lecture by Prof. Harold Wookey, senior surgeon, Toronto General Hospital, "Surgical Treatment of Malignant Disease of the Pharynx and Oesophagus." The lectures are open to those attending courses in the College and also to all other medical practitioners, dentists, and advanced students.

A course of surgery lectures will be delivered at the College from Oct. 1 to 16 daily, at 5 p.m. (Saturdays and Sundays excepted), and a course of lectures on anaesthesia from Oct. 6 to 21 daily, at 6.15 p.m. (Saturdays and Sundays excepted). The fee for each course is £5 5s.; Fellows and Members of the College and Licentiates in Dental Surgery will be admitted on payment of a fee of £3 3s. Applications, accompanied by cheque, should be sent to the secretary, Postgraduate Education Committee, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on July 29, with Mr. James M. Graham, President, in the chair, the following candidates, having passed the requisite examinations, were admitted Fellows:

J. H. Annan, P. Baer, C. A. Bathfield, B. Bellon, M. Berkowitz, A. L. Black, G. Boyd, W. S. Braidwood, K. C. Burrow, Leonore S. Cooke, Mary D. Daley, R. H. Dawson, W. H. Ekin, H. S. Gild, A. I. Goodman, I. G. Graber, G. K. Graham, K. E. Guest, R. H. Hannah, D. St. C. L. Henderson, P. S. Hollings, R. G. Hughes, J. Hurley, J. Hutchison, J. S. F. Hutchison, J. W. S. Irwin, R. E. Isaac, J. Joyce, D. J. Jussawalla, J. P. Kelly, H. F. Lowenthal, Philippa M. Ludlam, B. McCarthy, I. McLennan, S. Madden, K. L. Marks, F. J. C. Matthews, D. M. Milne, D. G. Morris, F. P. Morris, M. J. D. Noble, J. Orr, F. Paulson, R. E. Pow, T. M. Prossor, E. Rea, H. C. Rose, J. McL. Ross, J. Y. W. Russell, C. G. Saraiya, J. B. Scott, L. B. Scott, T. Sergeant, J. McG. Shaw, R. T. Simcox, R. V. P. Sinha, W. P. Small, R. J. S. Smith, T. Smith, V. G. Springett, M. Stein, W. H. Stephenson, Z. Taher, S. F. Thomas, J. C. Walker, J. Watson, A. G. D. Whyte, J. J. Williams, R. I. Wilson.

SOCIETY OF APOTHECARIES OF LONDON

At a meeting of the Court of Assistants on Aug. 19, with Dr. C. Thackray Parsons, the retiring Master, in the chair, Prof. E. C. Dodds, F.R.S., was elected Master for the ensuing year and Dr. A. P. Gibbons and Mr. D. C. L. Fitzwilliams were elected Wardens.

Sir Cecil P. G. Wakeley was appointed to represent the Society on the governing body of the British Postgraduate Medical Federation and Dr. Charles R. Box on the London Fever Hospital Research Fund.

The diploma of L.M.S.S.A. was granted upon examination to the following successful candidates: W. Whitchurch, M. Klein, P. H. Bevis, J. A. Stewart, W. Littlestone, C. Livingston, M. E. N. Smith, J. G. M. Anderson.

The Minister of Health, addressing the Annual Convention of the British Dental Students Association at Leeds recently, made it clear that the Government did not intend to dilute the dental profession by employing ancillaries to undertake treatment which should properly be carried out by dentists. He recalled that the Teviot Committee had recommended the training of dental hygienists forthwith. The Government intended to proceed with the experiment and invited the dental profession to join with them in studying it and assessing its results.

No. 32

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Aug. 9.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. *Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for:* (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1947					1946 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	66	6	32	2	3	34	2	19	—	1
Deaths		2	—				—	—		
Diphtheria	138	9	48	10	8	243	30	74	27	6
Deaths	1	—	—		—	2	—	2	—	—
Dysentery	78	10	16	—	—	84	12	21	—	—
Deaths					—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	1	—	3	—	—
Deaths		—					1			
Erysipelas			20	4	2			21	8	1
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				47					74	
Deaths	61	5	17		4	34	5	16	15	2
Measles*	5,488	303	52	185	4	3,299	350	105	34	4
Deaths	4	—	—		—	2	—	—	—	—
Ophthalmia neonatorum	66	4	14	—	—	58	2	15	1	—
Deaths										
Paratyphoid fever	7	2	3 (B)	1 (B)	—	13	—	—	—	—
Deaths	—	—	—		—	—	—	—	—	—
Pneumonia, influenzal	225	12	1	1	3	298	18	8	7	—
Deaths (from influenza)†	3	—	1		1	3	—	—	—	—
Pneumonia, primary			128	18				105	18	
Deaths		9			3		18		3	5
Polio-encephalitis, acute	56	9				1	—			
Deaths		1					—			
Poliomyelitis, acute	568	84	93	6	33	18	2	2	2	—
Deaths		1					—			
Puerperal fever		1	16		—		2	5		—
Deaths										
Puerperal pyrexia‡	103	6	11	—	—	149	9	9	2	—
Deaths		1					—			
Relapsing fever	1	1			—	—	—			—
Deaths										
Scarlet fever	680	61	114	18	19	707	60	118	16	14
Deaths	—	—	—		—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	9	—	1	1	4	89	1	2	10	—
Deaths	—	—	—		1	—	—	—	1	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	1,508	156	51	52	3	1,910	121	29	140	28
Deaths	7	—	1		—	7	—	1	—	—
Deaths (0–1 year)	295	44	64		15	301	42	52	32	10
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,603	562	475		89	3,599	550	509	159	95
Annual death rate (per 1,000 persons living)			9·9					11·2	10·2	
Live births	8,385	1347	1096		246	7,858	1227	970	369	238
Annual rate per 1,000 persons living			22·1					19·5	23·6	
Stillbirths	215	25	32			261	28	40		
Rate per 1,000 total births (including stillborn)			28					40		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

It is still not possible to publish the return of births and deaths for Eire for the weeks ended July 26, Aug. 2, and Aug. 9.

EPIDEMIOLOGICAL NOTES

Poliomyelitis

There were 646 cases of poliomyelitis notified in England and Wales during the week ended Aug. 16, compared with 568 in the week ended Aug. 9, and 448 in the week ended Aug. 2. During July notifications rose by 50% a week, but since then the increase has dropped to 27% and in the latest week to about 14%, which suggests that the steeply rising curve of incidence is beginning to flatten out.

Figures for some of the most affected county areas are not notably different from those of the previous week (given in parentheses): London 89 (84), Lancashire 71 (71), Durham 39 (36), Middlesex 32 (35). Substantially increased notifications were reported from Yorkshire East Riding 18 (5), Surrey 39 (24), and Warwickshire 37 (23). There was a continued decline in the weekly figures from Yorkshire West Riding 44 (57).

Notifications of polio-encephalitis were lower than in the previous week 45 (56). The distribution of notified cases of this condition does not appear to be closely related to that of the notified cases of poliomyelitis. About half the 45 cases of polio-encephalitis occurred in the areas mentioned above as having a heavier or rising incidence of cases of poliomyelitis.

The 568 notifications in the week ending Aug. 9 were made from all counties except Somersetshire, Huntingdonshire, Cambridgeshire, Nottinghamshire, Cardiganshire, Montgomeryshire, Isle of Ely, Anglesey, Rutlandshire, Flintshire, Merionethshire, and Radnorshire, and of these from only the last six named have no notifications been made during the present outbreak. More than 20 cases were reported from the following counties (increases (+) and decreases (−) on the previous week are shown in parentheses): London 84 (+31), Lancashire 71 (+35), Yorkshire West Riding 57 (−13), Durham 36 (−9), Middlesex 35 (+15), Surrey 24 (−8), Warwickshire 23 (+10), and Kent 21 (+8). A further seven counties reported between 10 and 20 cases during this week.

There were 56 cases of acute polio-encephalitis reported from 22 counties in the week ending Aug. 9—Yorkshire West Riding 11 and London 9 having the highest number of notifications.

The table below shows the notifications over a period of 12 weeks in the 1926 outbreak (1,160 cases), the 1938 outbreak (1,462 cases), and in the 12 weeks this year ending Aug. 16, during which time there had been 2,486 notifications.

Week	1926	1938	1947
22	2	5	3
23	8	5	22
24	9	—	31
25	10	4	44
26	3	3	56
27	5	6	79
28	8	8	110
29	16	19	177
30	25	41	302
31	20	61	448
32	37	81	568
33	47	77	646
Totals	190	310	2,486

Discussion of Table

In *England and Wales* 5,488 notifications of measles were made during the week, the largest weekly decrease, 1,466, since the beginning of June. There were also fewer fresh cases of whooping-cough 229, scarlet fever 123, diphtheria 62, pneumonia 46, and paratyphoid 12 than in the previous week.

The notifications of diphtheria, which numbered 138, were the lowest ever notified in a week; the previous minimum was 180 reported during the last week of 1946. Acute poliomyelitis notifications were 120 in excess of those during the previous week. Other increases observed were dysentery 25, cerebrospinal fever 18, acute polio-encephalitis 17, and typhoid 3.

The decline in the incidence of measles was general in most parts of the country; only two counties showed an increase of more than ten cases upon the notifications of the previous week—Gloucestershire 27 and Somersetshire 14. The largest decreases were reported from Yorkshire West Riding 380, Glamorganshire 116, Essex 90, Cumberland 65, London 63, Southampton 63, and Shropshire 60. Warwickshire, with 55 more notifications of whooping-cough, was the only county to have a large increase in the notifications of this disease; the largest decreases were London 39, Yorkshire West Riding 37, and Lancashire 32.

Little variation occurred, in comparison with the previous week, in the county notifications of scarlet fever or diphtheria; for the former the largest decreases were Warwickshire 26 and Staffordshire 23, while London had 17 fewer new cases of diphtheria than in the previous week.

The greatest contribution to the increase in the notifications of dysentery was made by Kent, with 9 more cases than in the previous week.

In *Scotland* there were increases in the notifications of acute poliomyelitis 56, pneumonia 49, whooping-cough 22, diphtheria 19, scarlet fever 16, and cerebrospinal fever 15. Of the 93 notifications of acute poliomyelitis, 36 were reported from Glasgow, compared with 17 in the previous week. Glasgow also had 14 more cases of cerebrospinal fever.

In *Eire* a decrease in the notifications of measles, 151, was the only item of interest.

In *Northern Ireland* notifications of acute poliomyelitis were 22 higher than in the previous week, but of this increase 4 cases were due to late notifications of earlier weeks. Of the 33 cases reported, 12 were notified from Belfast C.B., an increase of 8 on the previous week. There was little difference in the notifications of other diseases compared with the previous week.

Week Ending August 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 614, whooping-cough 1,870, diphtheria 145, measles 4,468, acute pneumonia 253, cerebrospinal fever 60, acute poliomyelitis 646, acute polio-encephalitis 45, dysentery 66, paratyphoid 17, and typhoid 8.

Medical News

Medical Department of the Navy

On and after Sept. 1 the address of the Medical Department of the Navy will be Queen Anne's Mansions, St. James's Park, London, S.W.1 (Tel.: Whitehall 9444).

Consultants and Specialists Spens Committee

A Committee has recently been set up by the Minister of Health and the Secretary of State for Scotland to advise on the range of total professional remuneration of registered medical practitioners engaged in the different branches of consultant or specialist practice in any publicly organized hospital and specialist service. The Committee are inviting evidence from the organizations directly interested. They will, however, be prepared to receive evidence from interested bodies or persons other than those specially invited, and it is requested that those wishing to place their views before the Committee should submit memoranda to the Joint Secretaries of the Committee, Ministry of Health, Whitehall, London, S.W.1, before the end of September.

Medical Research Council: New Members

The Committee of Privy Council for Medical Research have appointed Neil Hamilton Fairley, C.B.E., M.D., D.Sc., F.R.C.P., F.R.S. (Professor of Tropical Medicine in the University of London), and John Henry Gaddum, Sc.D., M.R.C.S., F.R.S. (Professor of Materia Medica in the University of Edinburgh), to be Members of the Medical Research Council from Oct. 1, 1947.

Conference of W.H.O.

The fourth session of the Interim Commission of the World Health Organization opens at Geneva on Aug. 30. Reports will be received on the W.H.O.'s field missions in China, Ethiopia, and Greece, its fellowship programme, and its epidemiological reporting service. The draft agenda includes such items as alcoholism, unification of pharmacopoeias, malaria, tuberculosis, habit-forming drugs, influenza, insulin requirements and supply, schistosomiasis, venereal disease, and cancer registration.

Cancer Research Bequest

The Donner Foundation has given a large building at Palm Beach, Florida, to the Institutum Divi Thomae at Cincinnati to provide quarters for a marine biophysics laboratory. Lower forms of sea life are convenient material for studying cell reproduction, and it is proposed to conduct cancer research at the laboratory.

U.S. Books for Exchange

The United States Army Medical Library in Washington has supplied U.N.E.S.C.O. with a list of more than 700 medical monographs for exchange on a piece-for-piece basis with medical literature published outside the United States. Files of purely local serial publications will be accepted.

Kashmir Health Service

Three well-equipped hospitals have recently been built at Srinagar, Jammu, and Mirpur. An infectious diseases hospital will shortly be opened at Srinagar also. Vaccination is compulsory and the incidence of deaths from smallpox and cholera negligible.

The Medical Directory

To maintain the accuracy of the annual volume of the *Medical Directory* the publishers, Messrs. J. and A. Churchill, Ltd. (104, Gloucester Place, London, W.1), rely upon the return of their schedule, which has been posted to every member of the medical profession. Should the schedule have been lost or mislaid they will gladly forward a duplicate upon request. The full names of the medical practitioner should be sent for identification.

Rheumatic Fever Research

An organization called the Helen Hay Whitney Foundation for Rheumatic Fever Research has been formed in New York, with Dr. Duckett Jones, Director of the American Heart Association, as medical director and supervisor of research.

COMING EVENTS

Film on Anterior Poliomyelitis

The Westminster and Holborn Division of the B.M.A. has arranged with the Central Office of Information for a film on anterior poliomyelitis, produced by the Ministry of Health, to be shown at the Meyerstein Hall, Westminster Hospital Medical School, S.W., on Thursday, Sept. 4, at 8.30 p.m. It is understood that the film stresses aspects of early diagnosis. The Ministry of Health's film on penicillin, in colour and equipped with sound track, will be shown also. The Division extends a cordial invitation to all practitioners in the area to attend ; medical students also will be welcomed.

Second Army Medical Services Reunion Dinner

It is proposed to hold a reunion dinner in November in London for all officers and ex-officers who served in the R.A.M.C. with Second Army (or formations under its command) in North-west Europe from 1944 to July, 1945. All officers and ex-officers who are interested in this proposal are asked to send their names and addresses (with former units) either to Dr. R. Gwyn Evans (33, Sandford Road, Mapperley, Nottingham) or to Dr. R. F. G. Ormrod (Fountain Court, Temple, London, E.C.4), so that preliminary arrangements can be made. Details will be announced later.

SOCIETIES AND LECTURES

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At West London Hospital, Hammersmith, W., Tuesday, Sept. 2, 8.30 p.m. Election of officers, etc.

A lecture course in anatomy, radiological anatomy, physiology, and applied physiology of the central nervous system will begin at the Maida Vale Hospital for Nervous Diseases on Monday, Sept. 29, under the direction of Prof. F. Goldby, Prof. Samson Wright, and the honorary staff of the hospital. The hospital can now provide facilities for postgraduate students of neurology which will satisfy the new regulations for the D.P.M. of the Conjoint Board. A weekly demonstration of clinical neurology, open to all postgraduates, will be held at the hospital in the autumn term, beginning on Friday, Sept. 26. Further details may be obtained from the dean of the medical school (Maida Vale, London, W.9).

A concentrated week-end course in the rheumatic diseases, suitable for general practitioners and demobilized officers, will be held at the Rheumatism Unit of the London County Council at St. Stephen's Hospital on Oct. 25 and 26. Lord Moran, P.R.C.P., will open the course, and the lecturers who are participating include Sir Adolphe Abrahams, Sir Thomas Fairbank, Dr. Francis Bach, Dr. Grace Batten, Dr. Blake Pritchard, Dr. Philip Ellman, Dr. G. D. Kersley, and Dr. David Shaw. Details may be had from the Fellowship of Postgraduate Medicine at 1, Wimpole Street, London, W.1.

BIRTHS, MARRIAGES, AND DEATHS

The charge for an insertion under this head is 10s. 6d. *for* 18 *words or less. Extra words* 3s. 6d. *for each six or less. Payment should be forwarded with the notice, authenticated by the name and permanent address of the sender, and should reach the Advertisement Manager not later than first post Monday morning.*

BIRTHS

DUNKERLEY.—On Aug. 12, 1947, at Lusways Nursing Home, Sidmouth, to Jena, wife of Dr. A. H. Dunkerley, "Malden," Sidmouth, a daughter.

HARPER.—On Aug. 10, 1947, at Cleveland Nursing Home, London, to Dr. Marita Harper (*née* Shattock), wife of Dr. Eric Imlay Harper, a son.

JOHNSON.—On Aug. 18, 1947, at Romsey Hospital, to Katherine (*née* Broadfoot), wife of Dr. Peter Johnson, of Linden House Cottage, a daughter.

WILSON.—On Aug. 20, 1947, at the Queen Elizabeth Hospital, Birmingham, to Patricia (*née* McCullough), wife of Noel Wilson, M.B., M.R.C.S., a daughter —Sheila.

MARRIAGES

FRYER–MCCONNELL.—On Aug. 16, 1947, at Uxbridge, Graham John Firth Fryer, M.R.C.S., to Catherine Hunter McConnell, Q.A.I.M.N.S./R.

O'MALLEY–JONES.—On Aug. 16, 1947, at Penycae, Wrexham, Austin G. O'Malley, M.B., Ch.B., to Iola Trevor Jones, M.R.C.O.G.

DEATH

COOK.—On Aug. 16, 1947, at Preston Royal Infirmary, John Stevens Cook, *M.C.*, M.B., Ch.B., aged 52.

Any Questions ?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Diagnosis of Poliomyelitis

Q.—*In the diagnosis of poliomyelitis, what laboratory investigations are necessary (1) to ascertain a carrier, and (2) for early diagnosis? In other words, how can an abortive case be diagnosed?*

A.—A symptomless poliomyelitis carrier can be recognized only by demonstrating virus in the oropharynx or the faeces. To do so, the material to be examined (throat-swab or garglings or faeces) after suitable treatment is injected intracerebrally into a monkey, which is the only susceptible host apart from man, although certain strains of the virus have been adapted to infect rodents. Diagnosis of a case seen in the pre-paralytic stage, often with some evidence of meningeal irritation, is helped by lumbar puncture, which usually reveals an increase of cells (10–100 per c.mm.), partly lymphocytes, partly polymorphs, with little else abnormal. Experimental infection in monkeys has shown that in the pre-paralytic stage, which corresponds to abortive poliomyelitis, invasion of the central nervous system with virus has already occurred. If this stage is accompanied by meningeal inflammation, as is usual, an early cellular reaction followed by an increase of protein may be expected in the cerebrospinal fluid. However, cases of abortive and paralytic poliomyelitis have apparently occurred without any obvious changes in the cerebrospinal fluid. Samples of serum taken during the acute and convalescent stages may be examined for the development of neutralizing antibody, but this diagnostic test, using either monkeys or mice, has in the past given equivocal results.

Horse-fly Bites

Q.—*At this time of year the cleg, or horse-fly, is common in the country, and its bite often causes severe irritation, especially in women. What is the best antidote?*

A.—There are three British genera of horse-flies which are easily distinguished: *Tabanus* has clear wings, *Crysops* has large dark patches on the wings, and those of *Haematopola* are finely mottled. They usually attack at different points, *Tabanus* apparently preferring the legs, *Crysops* the back of the neck, while *Haemotopola* bites at the waist level, so that hands and wrists are liable to suffer. These flies are usually encountered near their breeding-grounds, which, for many British species, consist of wet meadows, muddy farm lanes, or boggy waste ground. Protection from bites could probably be ensured for several hours by a skin application of dimethyl phthalate. People vary considerably in their reaction to the bites, which sometimes take a long time to heal. As with most insect bites, there seems to be no specific treatment, but soothing lotions would appear to be indicated.

Urethritis

Q.—*A newly married man of 25 has suffered from urethritis for about a week. Only two drops of creamy pus are obtainable for examination at any time. Pus cells are numerous and well preserved, but no organisms are present either in direct films or on culture. The condition is believed to be non-gonococcal. What further investigations should be undertaken and what treatment do you advise?*

A.—Cultures should be repeated in a laboratory known to be able to grow gonococci (such laboratories are limited in number). If gonococci are still not demonstrable a search should be made for *Trichomonas vaginalis*. In the absence of any infecting organism treatment should consist of alkaline diuretics ; if these fail, gentle irrigation with a weak solution of potassium permanganate (1/10,000) once or twice daily should be tried ; alternatively mercury oxycyanide 1/5,000 may be used. If the condition persists in spite of treatment the prostatic fluid should be examined.

Insulin

Q.—*What are the latest views on the mode of action of insulin? Are the anti-insulin effects of anterior-pituitary glycotropic and ketogenic hormones exerted directly or through the adrenal cortex?*

A.—Various theories have been advanced to account for the action of insulin *in vitro* as part of an enzyme system, or as reacting with such a system. Of these the most important is that of Cori *et al.* (*J. biol. Chem.*, 1947, **168**, 583), based on extensive experimental evidence which appears to be convincing although it has not as yet been independently confirmed. According to Cori, a point of action of both anterior-pituitary extract and insulin is the enzyme hexokinase. This enzyme is widespread in the tissues of the body and catalyses the transfer of a phosphoric acid group from adenosine triphosphate to glucose, to give glucose-6-phosphate and adenosine diphosphate. It is possible that the formation of glucose-6-phosphate under the influence of the hexokinase system obligatorily precedes the utilization of glucose for most purposes in the body. Cori's work shows that the action of hexokinase can be inhibited *in vitro* by anterior-pituitary extract, and that this pituitary-induced inhibition of hexokinase can be released *in vitro* by the addition of insulin. Thus an important action of insulin in the intact animal may be the release of hexokinase from anterior-pituitary inhibition, which would permit the preliminary step, under the influence of the enzyme, necessary for the utilization of glucose for different purposes. It seems improbable that this is the only way that insulin acts in the body, since hypophysectomized animals are extremely sensitive to the hypoglycaemic action of insulin; there is no evidence that the activity of hexokinase itself is stimulated by insulin, the action of insulin being limited to the release of the inhibition of hexokinase induced by the pituitary extract. It is likely that further work along the lines initiated by Cori may lead to the demonstration of an *in vitro* action of insulin on other enzyme systems, which might then account for the gaps in the present picture.

Since pituitary adrenocorticotropin and certain adrenal steroids all exert an anti-insulin action in experimental animals it is clear that some part of the anti-insulin action of crude anterior-pituitary extracts can be attributed to an action via the adrenal cortex. Nevertheless the anti-insulin (glycotropic) activity of anterior-lobe extracts is demonstrable in adrenalectomized rabbits, while the diabetogenic action of crude anterior-pituitary preparations has been demonstrated in the adrenalectomized, partially depancreatized dog by Houssay and his colleagues. It therefore seems certain that there are at least two pathways whereby anterior-pituitary factors may exert an anti-insulin action—one mediated by the adrenal cortex, and one not. The ketogenic pituitary factor is not sufficiently differentiated from the anti-insulin (glycotropic) and diabetogenic factors for anything to be said about the mechanism of its action on carbohydrate metabolism.

Antirabies Inoculation

Q.—*What is the normal course for prophylactic inoculations of antirabies vaccine; also the correct route of administration? How long does a course of inoculations afford protection, and how soon could a patient be considered safe? Are any untoward reactions likely, and, if so, what are they?*

A.—The normal course recommended for the carbolized rabies vaccine is 15 to 21 days, depending on the site and severity of the bite; whether the wound was treated with an antiseptic; whether the animal which inflicted the bite is known to have been rabid; and the time which has elapsed between the bite and the onset of treatment. The vaccine is injected subcutaneously in order to provide a depot for continuous absorption. Rabicidal antibodies may appear in the serum ten days after the close of the antirabies treatment, and have been found up to seven months later. The significance of these antibodies is questionable, since a person who has been bitten may not develop rabies and yet may show no rabicidal antibody. Conversely, a person with a high antibody titre may be unprotected by the vaccine and die from rabies.

Various types of reactions may occur after antirabies treatment. These are usually mild, consisting of fever, headache, giddiness, and local skin rashes. Rarely patients may suffer from serious, even fatal, reactions. These take the form of paralysis of different types and appear to be related to the post-vaccinal encephalomyelitis following certain infectious diseases.

Mosquito Bites

Q.—*What is the best repellant against mosquitoes, and what is the best treatment for bites?*

A.—Dimethyl phthalate is an efficient repellant against mosquitoes. Proprietary creams containing the substance are available, or the liquid itself may be used. It should be smeared lightly over the skin, care being taken to cover all exposed parts. It may cause transient smarting in abrasions or in the eye; and contact with such objects as fountain-pens, spectacle frames, synthetic watch-glasses, or certain artificial-silk stockings should be avoided as it is a solvent of plastic and similar substances.

Once a mosquito bite has occurred there is little that can be done to alleviate the irritation, although cooling solutions containing alkalis or a little menthol or phenol are often recommended. It is possible that anti-histamine drugs, such as "benadryl," might diminish the reaction to a bite, but these would have to be present in the tissues at the time and consequently will have little practical application. Septic complications may have to be dealt with later.

Anaesthesia for Circumcision

Q.—*What is the best sedation, apart from a general anaesthetic, for circumcision in an infant 3 to 6 weeks old?*

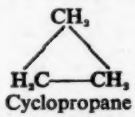
A.—No "sedative" short of the dose producing anaesthesia can be relied upon to give immobility during what must be the strong operative stimulus of circumcision. The most satisfactory drug for general analgesia short of unconsciousness is morphine, given in the correct dosage. For babies this should be at the rate of 1/40 gr. per stone (0.25 mg. per kilo) of body weight. Thus, for a child weighing 10 lb. (4.5 kg.) the hypodermic dose would be 1/60 gr. (1.08 mg.) of morphine. This is easily measured by dissolving a tablet of 1/6 gr. (11 mg.) in 10 ml. of water and throwing away 9 ml. of the solution.

Trilene, Cyclopropane, Vinesthene

Q.—*What are the chemical formulae of "trilene," cyclopropane, and "vinesthene"? What are the methods of administration of each drug, and what are their principal advantages?*

A.—The formulae are as follows:

$CCl_2.CHCl$
Trilene


Cyclopropane

$(CH_2.CH)_2O$
Vinesthene

Full details of their administration and advantages should be sought in a standard work, such as the *Textbook of Anaesthetics*, by Minnitt and Gillies. Briefly, trilene is a good alternative to chloroform, both when the explosion hazard is present and as an analgesic in midwifery. As a supplement in small dosage trilene smooths out the difficulties of nitrous-oxide–oxygen anaesthesia. Cyclopropane is a powerful non-irritating gas, given with oxygen and needing special skill and apparatus for its administration. Vinesthene resembles ethyl chloride in its clinical effect, but can in addition be given like ethyl ether for longer periods of time.

Tinnitus

Q.—*A man of 70, who is recovering from neurasthenia, suffers from tinnitus in both ears. He thinks that phenobarbitone aggravates the condition. Is there any reason for this? What treatment, if any, can be given?*

A.—In some subjects phenobarbitone has an initial stimulating effect, and it is possible that it is so acting in this case. Bromides would probably be useful in alleviating the symptoms, either as acid. hydrobrom. dil. or as the ammonium, potassium, or sodium bromides.

Terminating Pregnancy for Hyperemesis

Q.—*A young woman with tuberculosis of the lungs, and eight weeks pregnant, is suffering from hyperemesis gravidarum. Continuation of the pregnancy is dangerous; all palliative methods have failed. Could you please tell me the safest method of terminating the pregnancy?*

A.—Once it has been decided that induction of abortion is indicated in a case of hyperemesis it should be carried out *immediately*. There is therefore little place for "slow" methods of induction, and the uterus should be evacuated at "one sitting," the choice betweeen the vaginal and the abdominal approach depending on the size of the uterus. In this case it should be reasonably easy to lift out the ovum with sponge forceps after dilatation of the cervix. Irrespective of phthisis, the chief danger is the anaesthetic. Possibly the ideal is local analgesia supplemented, if need be, with intravenous thiopentone sodium. Cyclopropane would also be suitable. The operation should not be begun until the urine is free from acetone, and should be preceded and followed by a continuous intravenous glucose drip.

Loosening the Piston of a Syringe

Q.—*How can one loosen the plunger in a hypodermic syringe?*

A.—A sharp pull exerted after attaching the plunger by string to a fixed object is sometimes effective. An alternative is prolonged soaking in a solution of antiformin (equal parts of liquor sodae chlorinatae and 15% caustic soda: this should be diluted about 1 in 10 for the purpose). A further method, of which we have no experience, is recommended in a recent issue (July–August, 1947) of the *Bulletin of the Institute of Medical Laboratory Technology*. The cap of the syringe is removed, if necessary by unscrewing the piston rod, and the barrel above the piston packed with ice. The syringe is then placed in the freezing compartment of a refrigerator. When it is thoroughly cold the barrel is immersed in tepid water; it is then held in a folded cloth and a direct, even pull is exerted on the piston.

NOTES AND COMMENTS

Saturated Solutions for Dispensing.—Mr. H. W. TOMSKI, M.P.S. (Pinner, Middlesex), writes: With reference to the reply (Aug. 9, p. 238) to a correspondent's inquiry about the use of saturated aqueous solutions for dispensing purposes, I would like to offer the following observations. A saturated solution is one in which no more of the substance will dissolve, and the *B.P.* states the number of parts of water required for the preparation of such solutions at 15.5° C. for various chemicals. It appears that your answer was based on this information. In practice, however, the addition of a substance to water yields a solution of far greater volume than the water itself. Thus, while 1 part of sodium chloride requires 3 parts of water, 1 part of the substance is contained in about 3.39 parts of the final solution. Some time ago, I had occasion to carry out a number of experiments to determine the quantity of substance in 1 fluid drachm (3.5 ml.) of saturated solution prepared under ordinary dispensing conditions. The following results were obtained from some of the solutions investigated: ammonium carbonate 12.1 gr.—0.78 g.; potassium bromide 22.2 gr.—1.43 g.; potassium citrate 41.1 gr.—2.71 g.; sodium bicarbonate 4.8 gr.—0.32 g.; sodium chloride 16.1 gr.—1.07 g.; sodium salicylate 33.8 gr.—2.24 g.

The addition of chloroform to concentrated solutions of potassium citrate is recommended to prevent fungal growth. Darkening of sodium salicylate solutions is due to atmospheric oxygen, and oxidation is enhanced in concentrated solutions and in the presence of alkali. The problem of retarding this process is dealt with in a paper published by me in the *Pharmaceutical Journal* (Jan. 24, 1942, p. 32). The addition of 1 in 500 potassium pyrosulphite to a 50% aqueous solution prevents darkening for about six weeks.

Bringing up Baby.—Dr. S. P. CASTELL (Thorpe, Norwich) writes: Dr. E. J. Dennison's letter (Aug. 9, p. 238) shares a fault with the reply to which he objects, that of stating a principle without guarding against misapplication by a dangerous minority. To believe in a principle (even a good one) is not enough. One may believe in the value of cookery and yet be an atrocious cook. We may concede that the proper upbringing of children includes some restraint, yet note that a belief in discipline is held by some who can neither control their children nor themselves. Controlling a car includes some use of the brakes, but a devout belief in their value is not enough to make a good driver, and the man who stands on his brakes and skids his car across the road is apt to feel a bit of a fool. Let us not support the popular fallacy that belief in some slogan—discipline—freedom—patience, etc., is enough. That makes the problem appear a more insoluble problem than ever. I wish Dr. Dennison had not declared himself in favour of "thwarting," rather than restraint. It suggests that one should thwart for thwarting's sake.

Judicial Hanging.—Lieut.-Col. F. A. BARKER, I.M.S. (ret.), of Didcot, Berks, writes: Col. N. J. C. Rutherford's use of the word "jail" instead of "prison" (Aug. 16, p. 282) makes one think he was referring to Indian jails. If so, I can assure him that "all the official spectators" of a hanging do not walk away as the trap-door is released. The doctor (either medical superintendent of the jail or the civil surgeon in medical charge) first ascertains that the momentary rigor has ceased and that the body is hanging inert and clear of the walls before he leaves the shed, and the jailer keeps him company and himself locks the door of the shed when they depart. Thirty years ago the body had to hang for one hour before the doctor pronounced life to be extinct; this period has since been reduced by law to half an hour. On one occasion I had, as medical superintendent, to hang five persons on one morning. Three were hanged side by side at one drop, and the remaining two an hour later. But one busy civil surgeon would not wait and hanged six persons at one drop (to the great anxiety of the jailer, who feared that the beam would not stand the strain). In both these cases the hangings passed off without any untoward incident, and death was instantaneous.

Physical Sign in Pulmonary Tuberculosis.—Dr. F. A. NASH (London, N.21) writes: I wish to draw attention to a physical sign that is often present in cases of pulmonary tuberculosis, even when other signs are few or absent. The patient stands with his back towards the observer and about five feet away. If he shows a tendency to stand to "attention," he is told to relax and allow his arms to hang loosely at sides. He is then instructed to breath in and out rather more deeply and rapidly than usual. The observer compares the amount of movement of the points of the shoulders. I have found the movement is often diminished considerably on what *x*-rays show to be the affected side, even when inspection and palpation of the thoracic cage reveal no signs.

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